SECCHI DISC CHLOROPHYLL a SELF-HELP PROGRAM

1981 Sampling Results for Lakes in the Central Region of the Ministry of the Environment

Ontario
Ministry of the Environment
Central Region

Suite 700
150 Ferrand Drive
Don Mills, Ontario
M3C 3C3
(416) 424-3000

1) Allen Lake, Dudley & Harcourt Townships, Haliburton
2) Balsam Lake, Bexley Township, Victoria County
3) Bass Lake, Township of Muskoka Lakes, Muskoka
4) Bass Lake, Orillia & Oro Townships, Simcoe County
5) Bat Lake, Minden Township, Haliburton
6) Beech Lake, Stanhope Township, Haliburton
7) Big Barnham Lake, Dudley Township, Haliburton
8) Big Straggle Lake, Harcourt Township, Haliburton
9) Black Lake, Township of Muskoka Lakes, Muskoka
10) Boshkung Lake, Stanhope Township, Haliburton
11) Bruce Lake, Township of Muskoka Lakes, Muskoka
12) Cameron Lake, Fenelon Township, Victoria County
13) Canning Lake, Minden & Snowdon Townships, Haliburton
14) Chandos Lake, Chandos Township, Peterborough County
15) Clear Lake, Town of Bracebridge, Muskoka
16) Clearwater Lake, Town of Gravenhurst, Muskoka
17) Davis Lake, Lutterworth Township, Haliburton
18) Doeskin Lake, Town of Gravenhurst, Muskoka
19) Drag Lake, Dudley & Dysart Township, Haliburton
20) Dummer Lake, Dummer Township, Peterborough County
21) East Lake, Harcourt Township, Haliburton
22) Farlain Lake, Tiny Township, Simcoe County
23) George's Lake, Harcourt Township, Haliburton
24) Gibson Lake, Township of Georgian Bay, Muskoka
25) Go Home Lake, Township of Georgian Bay, Muskoka
26) Haliburton Lake, Harburn Township, Haliburton
27) Harp Lake, Town of Huntsville, Muskoka
28) Head Lake, Laxton & Digby Townships, Victoria County
29) Kashagawigamog Lake, Dysart & Minden Townships, Haliburton
30) Kasshabog Lake, Belmont & Methune Townships, Peterborough County
31) Kawagama Lake, Sherborne, Havelock, Livingstone & McClintock Townships, Haliburton
32) Kennisis Lake, Havelock & Guilford Townships, Haliburton
33) Lake Joseph, Township of Muskoka Lakes, Muskoka
34) Lake of Bays, Township of Lake of Bays, Muskoka
35) Lake Muskoka, Township of Muskoka Lakes, Muskoka
36) Lake Rosseau, Township of Muskoka Lakes, Muskoka
37) Lake St. John, Rama Township, Simcoe County
38) Leech Lake, Town of Bracebridge, Muskoka
39) Leonard Lake, Monck Ward, Muskoka
40) Little Lake, Township of Georgian Bay
41) Little Kennisis Lake, Havelock Township, Haliburton
42) Little Straggle Lake, Harcourt Township, Haliburton
43) Long Lake, Dudley Township, Haliburton
44) Long Lake, Township of Muskoka Lakes, Muskoka
45) Loon Lake, Dysart Township, Haliburton
46) Mary Lake, Town of Huntsville, Muskoka
47) Medora Lake, Township of Muskoka Lakes, Muskoka
48) Miskwabi Lake, Dudley Township, Haliburton
49) Morrison Lake, Town of Gravenhurst, Muskoka

SECCHI DISC CHLOROPHYLL a SELF-HELP PROGRAM cont'd

50) Mountain Lake, Miden Township, Haliburton
51) Muldrew Lake, Town of Gravenhurst, Muskoka
52) Muskoka Bay, Town of Gravenhurst, Muskoka
53) Nine Mile Lake, Township of Muskoka Lakes, Muskoka
54) Orr Lake, Flos Township, Simcoe County
55) Percy Lake, Harburn Township, Haliburton
56) Pine Lake, Town of Gravenhurst, Muskoka
57) Pine Lake, Town of Bracebridge, Muskoka
58) Ril Lake, Township of Lake of Bays, Muskoka
59) Round Lake, Belmont Township, Peterborough County
60) Salerno Lake, Snowdon & Glamorgan Townships, Haliburton
61) Six Mile Lake, Township of Georgian Bay, Muskoka
62) Skeleton Lake, Township of Muskoka Lakes, Muskoka
63) Soyers Lake, Minden Township, Haliburton
64) Sparrow Lake, Town of Gravenhurst, Muskoka
65) Tasso Lake, Township of Lake of Bays, Muskoka
66) Tooke Lake, Township of Lake of Bays, Muskoka
67) Twelve Mile Lake, Minden Township, Haliburton
68) Waseosa Lake, Town of Huntsville, Muskoka
69) Wenona Lake, Dudley Township, Haliburton
70) Wood Lake, Town of Bracebridge, Muskoka

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SECCHI DISC - CHLOROPHYLL a SELF-HELP PROGRAMME

The "Self-Help Programme" was initiated in 1971 in response to many requests from concerned cottagers for water quality surveys on many recreational lakes throughout the Province. In the Self-Help Programme, cottagers perform the sample collection on their lakes and the Ministry analyzes and interprets the water quality information.

Volunteers in the Self-Help Programme are supplied with sampling kits which include a Secchi disc, a water sampler, sample bottles and instructions. Participants are asked to take Secchi disc readings and collect water samples bi-weekly during the ice-free period of the year. The water samples are then shipped to the nearest Ministry of the Environment laboratory where they are analyzed for chlorophyll a. The true value of this program will only be realized if it is continued for a number of years in order to define long-term trends with regard to variations in the enrichment status of the lakes.

Enrichment of lakes occurs when fertilizing nutrients, such as nitrogen and phosphorus, enter the lake via rainfall, runoff from land, and shoreline development activities (i.e. subsurface disposal systems, land clearing, etc). These nutrients promote the growth of aquatic plants and algae. It is important to realize that small to moderate amounts of aquatic plants and algae are necessary to provide food for aquatic, invertebrate organisms which serve, in turn, as food for fish. Too much growth, however, may interfere with water-oriented, recreational activities.

Previous experience has indicated that there are three general categories of lake enrichment. All three categories exist in nature, however, man's activities can alter a lake's enrichment status. The transparency of the water as indicated by Secchi disc readings and the density of suspended, microscopic, aquatic plants called algae, as indicated by chlorophyll a concentrations are measurements that are used to determine the enrichment status of a lake. The following table shows how these two measurements are interpreted to determine the enrichment status of a lake.

Enrichment Status	Secchi Disc (S.D.) (meters - m)	Chlorophyll a Concentrations (Chl. a) (micrograms/litre - ug/L)
Enriched	0-3 m	4 ug/L or greater
Moderately Enriched	3-5 m	2-4 ug/L
Unenriched	5 m or greater	0-2 ug/L

Enriched Lakes

These lakes have high concentrations of nutrients and are characterized by excessive growths of algae and aquatic weeds. This may interfere with water-oriented, recreational activities. As a result of the large amount of algae suspended in the water, Secchi disc readings are generally less than 3 metres and chlorophyll a concentrations are 4 ug/L or greater.

Moderately Enriched Lakes

These lakes have moderate concentrations of nutrients and are characterized by moderate growths of algae and aquatic weeds. They are suitable for the pursuit of water-oriented, recreational activities, however, they may develop periodic problems such as algae blooms. Secchi disc readings range from 3 to 5 metres and chlorophyll a concentrations range from 2 to 4 ug/L.

Unenriched Lakes

These lakes are the most desirable from a recreational standpoint. If these lakes are deep, they may support a cold water fishery such as lake trout. These are usually clear-water lakes, with low concentrations of nutrients. Secchi disc readings are 5 metres or greater and chlorophyll a concentrations are less than 2 ug/L.

JB/ns/W-R

Allen Lake

Dudley & Harcourt Townships

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Allen Lake in 1981.

Station 1 Main

Date	S.D.	Chl.a
June 7	8.0	0.8
June 28	5.0	2.0
July 19	4.5	DM
Aug. 9	5.5	2.5
Aug. 23	5.5	1.4
Sept. 7	7.0	1.0
Mean	5.9	1.5

DM - Data Missing

Secchi disc readings ranged from 4.5 to 8.0m during the sampling period. The highest degree of water transparency occurred in early summer and early fall. Chlorophyll a concentrations were low, ranging from 0.8 to 2.5 ug/L. Based on the seasonal means, Allen Lake would be considered unenriched, characterized by a high degree of water transparency and low densities of suspended algae. We apologize for the missing data which apparently was the result of a computer problem. We hope to have the system functioning properly for the 1982 program.

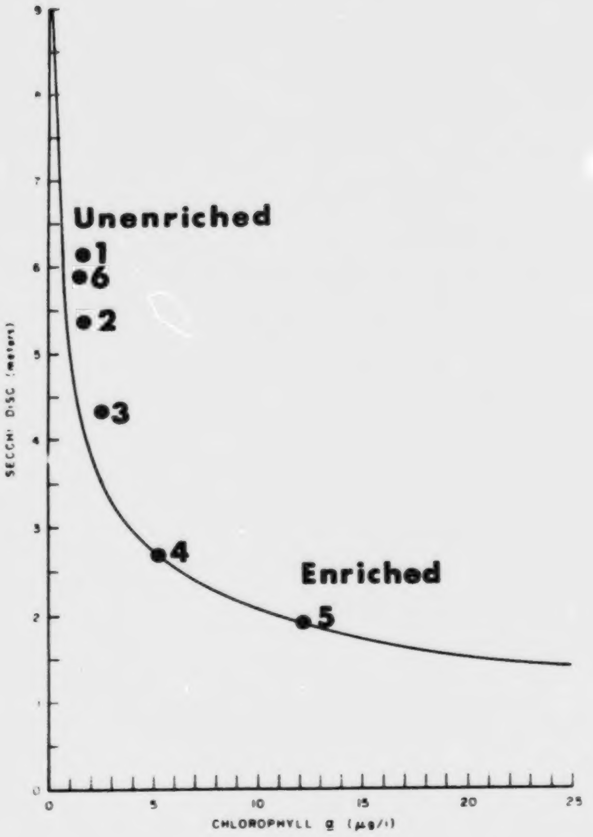
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Allen Lake from 1973 to 1981.

Station	Main		Deep Basin	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973	4.7**	1.3**		
1974	4.9	1.2		
1975	5.6	1.8		
1976	5.3	1.8		
1977	5.6	- -	5.3*	1.3*
1978	5.3	1.6		
1979	5.2	1.8		
1980	5.3	2.1		
1981	5.9	1.5		

* MOE data

** Based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Allen Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Allen Lake - 1981

Over the last nine years, an excellent Self-Help Program has been conducted on Allen Lake. The degree of water transparency over that period has increased somewhat from 4.7m in 1973 to 5.9m in 1981. The densities of suspended algae have remained relatively constant. The water quality of Allen Lake continues to be excellent. We hope that participation in this program continues.

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Ontario Ministry of the Environment, Central Region, 150 Ferrand Drive, DON MILLS, Ontario, M3C 3C3, Telephone: (416) 424-3000, Attention: Dhan Sharma

Balsam Lake

Bexley Township

Victoria County

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Balsam Lake in 1981.

Station Date	South End North Bay S.D.	 Chl. a
July 19	3.0	2.1
Aug. 3	3.5	DM
23	4.0	2.0
Mean	3.5	2.0

DM - data missing

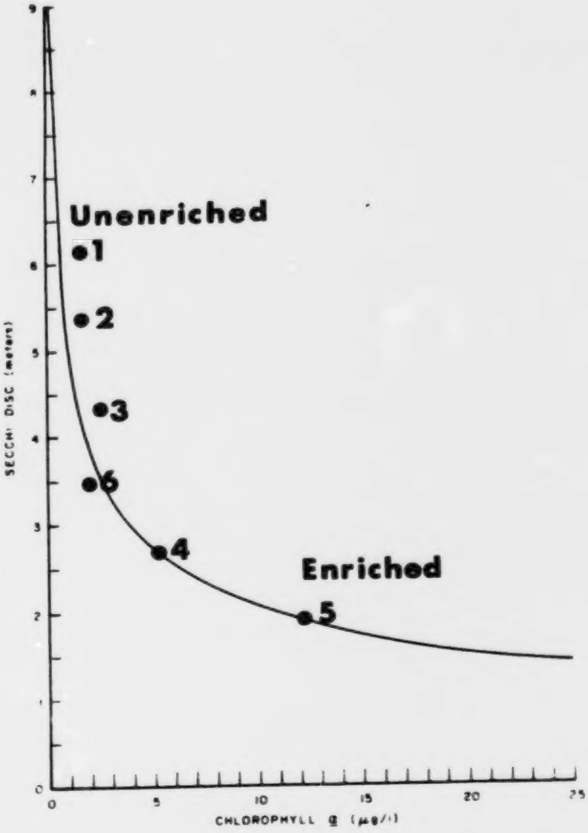
Insufficient samples were taken to allow meaningful conclusions to be made. It is recommended that at least six samples be taken throughout the ice free period in order to get a reliable seasonal mean.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Balsam Lake in 1981.

Station Year	North Bay S.D.	 Chl. a
1971		
1972		
1973		
1974		
1975		
1976		
1977		
1978		
1979		
1980		
1981	3.5*	2.0*

* Based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Balsam Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Balsam Lake - 1981

If participation in this program is to be continued, the sampling frequency must be increased.

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Bass Lake

Medora Ward

Township of Muskoka Lakes
District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Bass Lake in 1981.

Station	Center Bay	
Date	S.D.	Chl.a
May 18	3.5	1.7
June 7	5.5	3.8
June 14	4.5	3.7
June 21	3.25	3.5
July 5	4.5	3.4
Aug. 3	5.0	2.6
Aug. 9	4.5	4.8
Aug. 16	4.75	1.1
Aug.30	4.5	3.3
Sept. 7	5.5	1.9
Mean	4.6	3.0

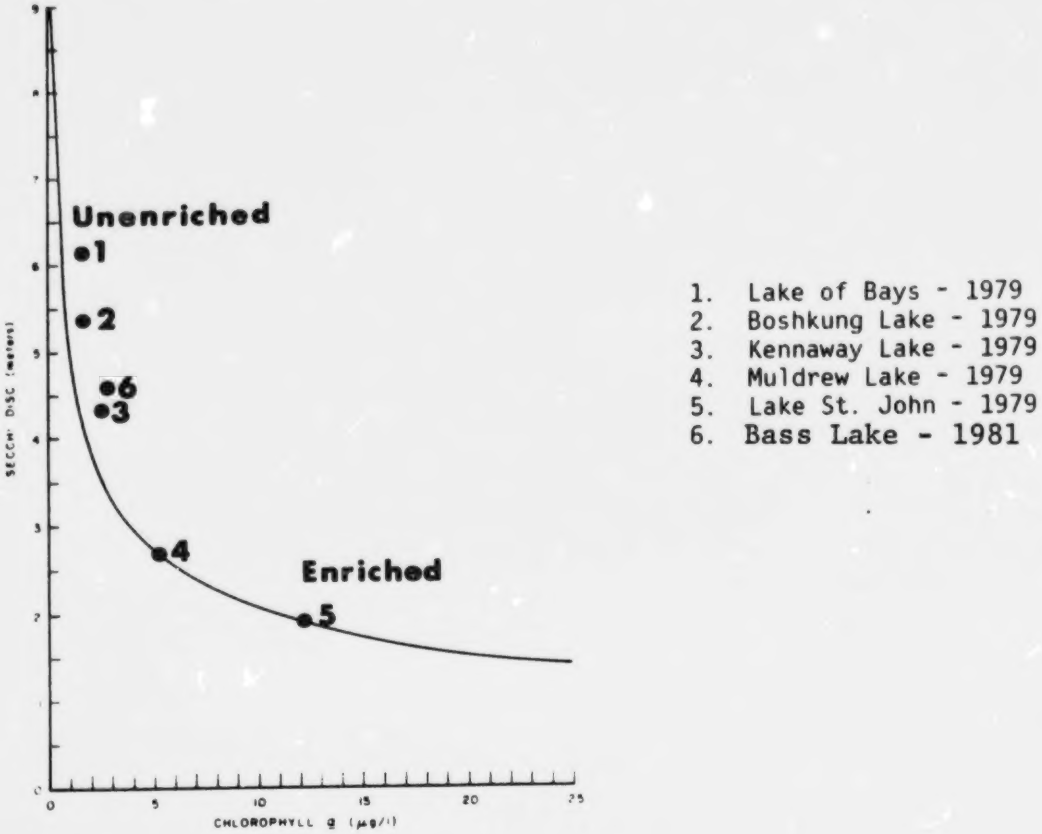
Secchi disc readings ranged from 3.25 to 5.5m during the sampling period. The highest degree of water transparency occurred in early summer and early fall. Chlorophyll a concentrations ranged from 1.1 to 4.8 ug/L. Based on the seasonal means for these two parameters, Bass Lake would be considered moderately enriched, characterized by a moderately high degree of water transparency and moderate densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Bass Lake in 1981.

Station	Center Bay		Deep Basin	
Year	S.D.	Chl.a	S.D	Chl.a
1971				
1972			3.9*	4.1*
1973				
1974				
1975				
1976				
1977				
1978				
1979				
1980				
1981	4.6	3.0		

* MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Bass Lake and a number of recreational lakes in the province. All data are seasonal means.



An excellent sampling program was conducted on Bass Lake in 1981. A water quality survey was done on Bass Lake in 1972 and the results are included on Table 2. Since 1972 there has been a slight increase in the degree of water transparency and a decrease in the densities of suspended algae. We recommend that participation in this program continue in order to determine whether this represents a long term change in enrichment status.

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Bass Lake

Orillia & Oro Townships

Simcoe County

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Bass Lake in 1981.

Station Date		Main S.D.	Chl.a
May	28	5.3	0.7
June	1	5.5	0.7
July	2	3.5	2.8
	14	2.7	D.M.
	22	2.5	D.M.
Aug.	4	2.4	1.8
	19	3.0	8.4
Sept.	7	4.1	2.2
	15	3.5	3.9
	29	3.5	2.2
Oct.	13	4.0	3.3
Mean		3.6	2.9

D.M. - data missing

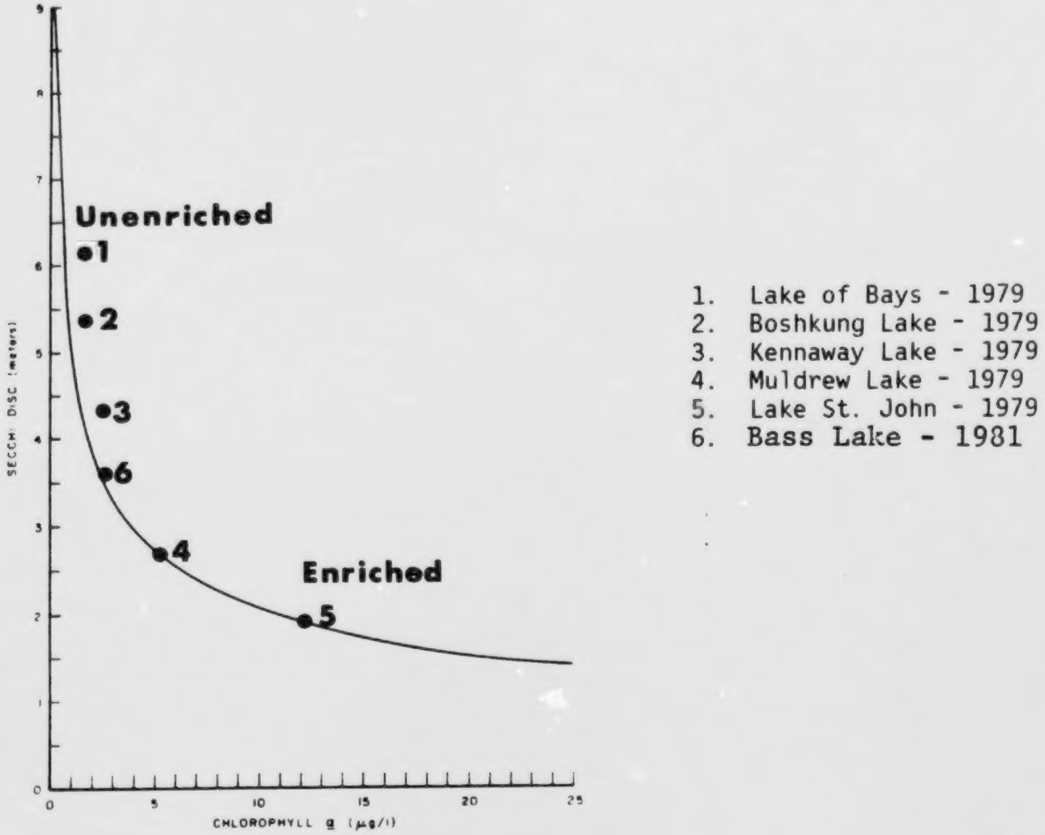
Based on the mean values of the two parameters shown in Table 1 Bass Lake is considered moderately enriched with moderate algal densities and a moderate degree of water transparency.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Bass Lake from 1973 to 1981.

Station Year	Main S.D.	Chl.a
1971		
1972		
1973	2.2	2.6
1974	2.0(1.6*)	2.4(6.4*)
1975	1.9	6.5
1976	2.0	4.8
1977	2.1	- -
1978	1.8	6.7
1979	2.3	6.1
1980	3.5	4.6
1981	3.6	2.9

* MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Bass Lake and a number of recreational lakes in the province. All data are seasonal means.



There may be a trend, in the results shown in Table 2, of improving enrichment status in the lake in recent years. Continued participation in the sampling program is encouraged.

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Bat Lake

Minden Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Bat Lake in 1981.

Station	1 Middle	
Date	S.D.	Chl.a
May 19	1.75	8.7
May 26	2.50	5.8
June 1	2.75	6.6
June 7	2.25	5.5
June 14	2.25	6.5
June 21	2.75	5.2
June 28	2.75	4.7
July 6	2.5	5.5
July 12	2.50	4.3
July 19	2.75	5.4
July 26	2.25	DM
Aug. 3	2.50	DM
Aug. 8	3.00	8.9
Aug. 16	2.50	4.2
Aug. 23	2.75	4.0
Aug. 31	DM	2.1
Sept. 7	2.75	5.0
Mean	2.5	5.5

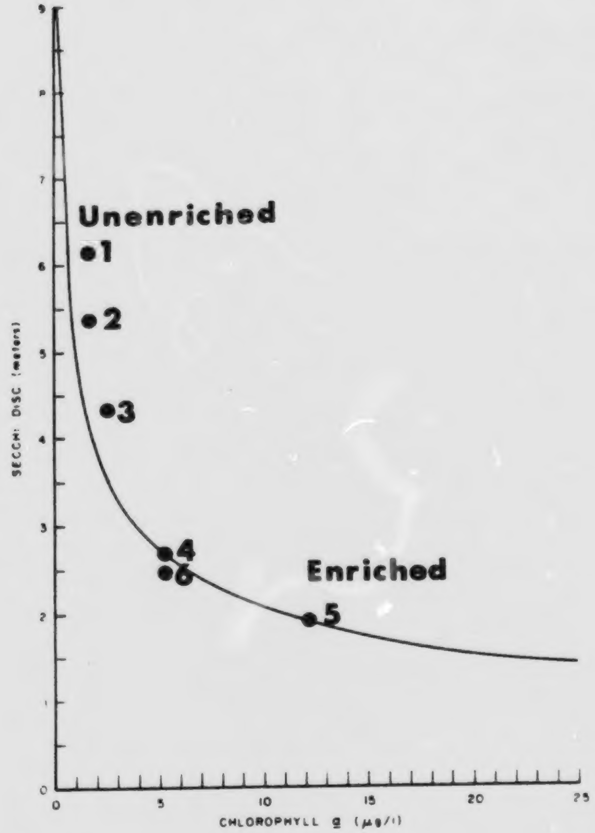
DM - data missing

Secchi disc readings ranged from 1.75 to 3.0m during the sampling period. The degree of water transparency remained relatively constant over the sampling period. Chlorophyl a concentrations ranged from 2.1 to 8.9 ug/L. Based on the seasonal means for these two parameters, Bat Lake would be considered enriched, characterized by a low degree of water transparency and high densities of suspended algae. We apologize for the missing data which apparently was the result of a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Bat Lake in 1981.

Station	1.Middle	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977		
1978		
1979		
1980		
1981	2.5	5.5

Figure 1: The relationship between Secchi disc and chlorophyll a for Bat Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Bat Lake - 1981

We congratulate the cottagers of Bat Lake for conducting an excellent sampling program in 1981. This is their first year of sampling so we do not have any historical data on water quality as yet. We encourage continued participation in this program in order to determine any long term changes in water quality.

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Beech Lake

Stanhope Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Beech Lake in 1981.

Station	1.	
Date	S.D.	Chl.a
July 12	5.5	2.8
July 19	4.5	3.6
Aug. 3	4.5	DM
Aug. 16	3.5	3.2
Mean	4.5	3.2

D.M. - data missing

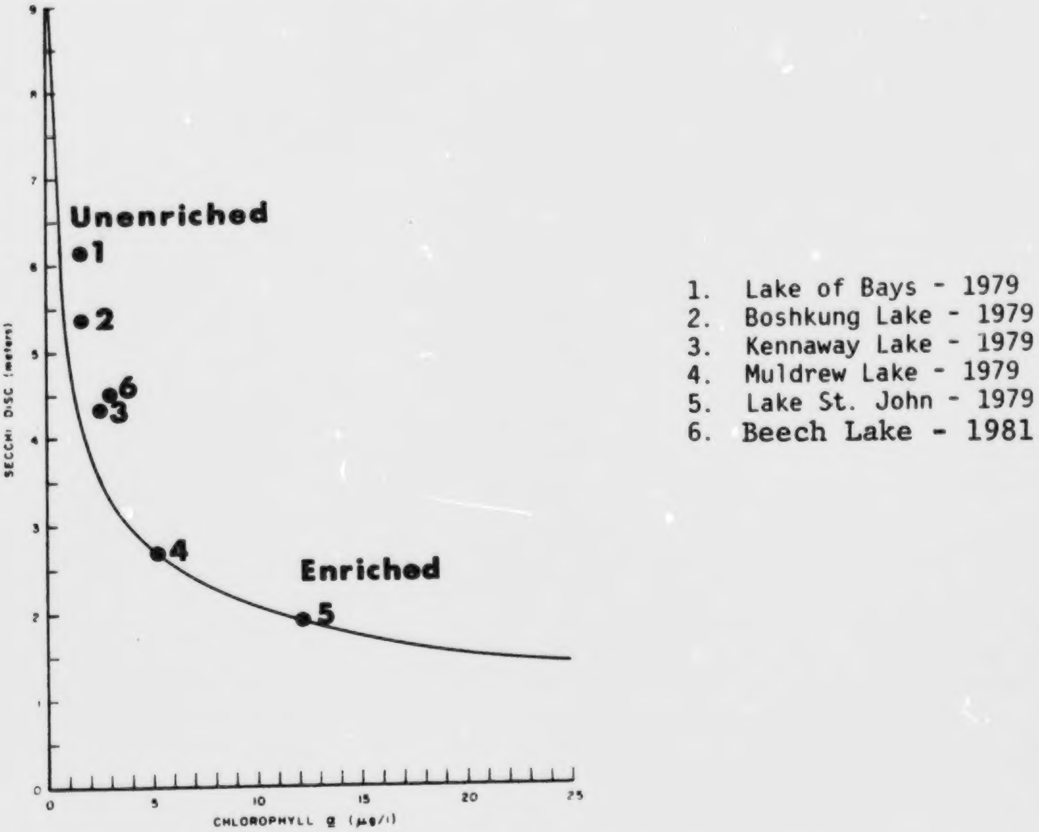
The Secchi disc readings ranged from 3.5 to 5.5m and the chlorophyll a concentrations ranged from 2.8 to 3.6 ug/L during the sampling period. We would recommend that the sampling frequency be increased in order to get a reliable seasonal mean. Based on the seasonal means available, Beech Lake would be classified as a moderately enriched lake, characterized by a moderately high degree of water transparency and moderate densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Beech Lake from 1976 to 1981.

Station	1	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976	5.3	1.9
1977	5.3*	- -
1978	4.8*	1.5*
1979	5.0*	1.9*
1980	- -	- -
1981	4.5*	3.2*

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Beech Lake and a number of recreational lakes in the province. All data are seasonal means.



In 1981, Beech Lake appears to have experienced an increase in densities of suspended algae and a decrease in water transparency from previous years. From 1976 to 1979, Beech lake was considered unenriched but in 1981 it would be considered moderately enriched. We recommend that this program be conducted in 1982 to determine whether this is a temporary change in water quality or a long-term change.

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Big Barnham Lake

Dudley Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Big Barnham Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
June 14	- -	2.3
June 21	5.0	2.6
June 28	5.0	5.4
July 26	4.0	DM
Aug. 3	4.5	DM
Aug. 16	5.0	5.3
Aug. 23	5.0	1.3
Mean	4.8	3.4

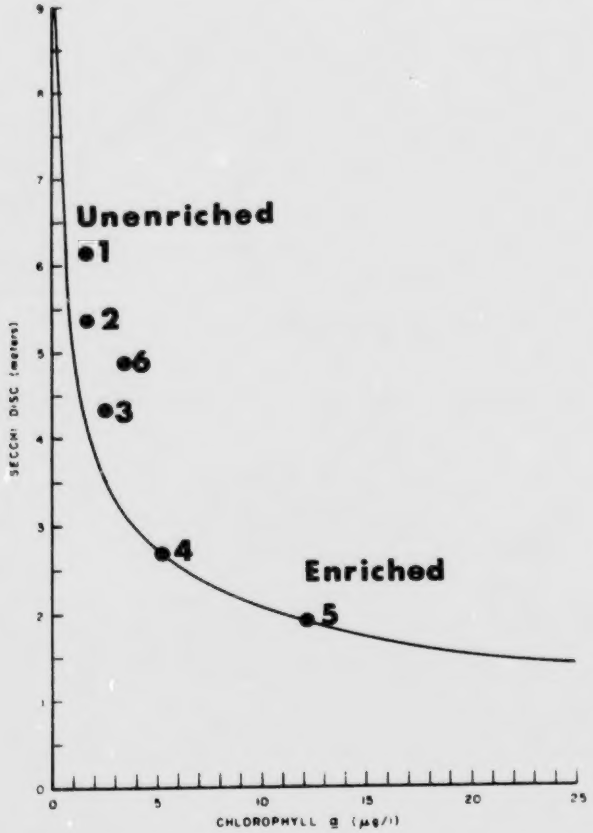
DM - data missing

The Secchi disc readings ranged from 4.0 to 5.0 m and chlorophyll a concentrations ranged from 1.3 to 5.4 ug/L. Based on the seasonal means for these two parameters, Big Barnham Lake would be considered moderately enriched, characterized by moderate densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Big Barnham Lake from 1975 to 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975	5.5	1.6
1976	4.7	4.0
1977	6.0	- -
1978	5.9	1.4
1979	5.6	2.0
1980	4.8	1.6
1981	4.8	3.4

Figure 1: The relationship between Secchi disc and chlorophyll a for Big Barnham Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Big Barnham Lake - 1981

A good sampling program was conducted on Big Barnham Lake in 1981. The results of that program indicate that average chlorophyll a levels increased from levels observed in all previous years except 1976. The reason for this is not apparent, however, we recommend that this program be continued in order to determine long-term water quality changes.

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Big Straggle Lake

Harcourt Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Big Straggle Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
May 18	5.0	1.8
May 24	8.0	7.0
June 12	4.9	2.9
June 28	4.0	3.5
Aug. 9	6.5	1.9
Aug. 23	6.9	1.9
Mean	5.9	3.2

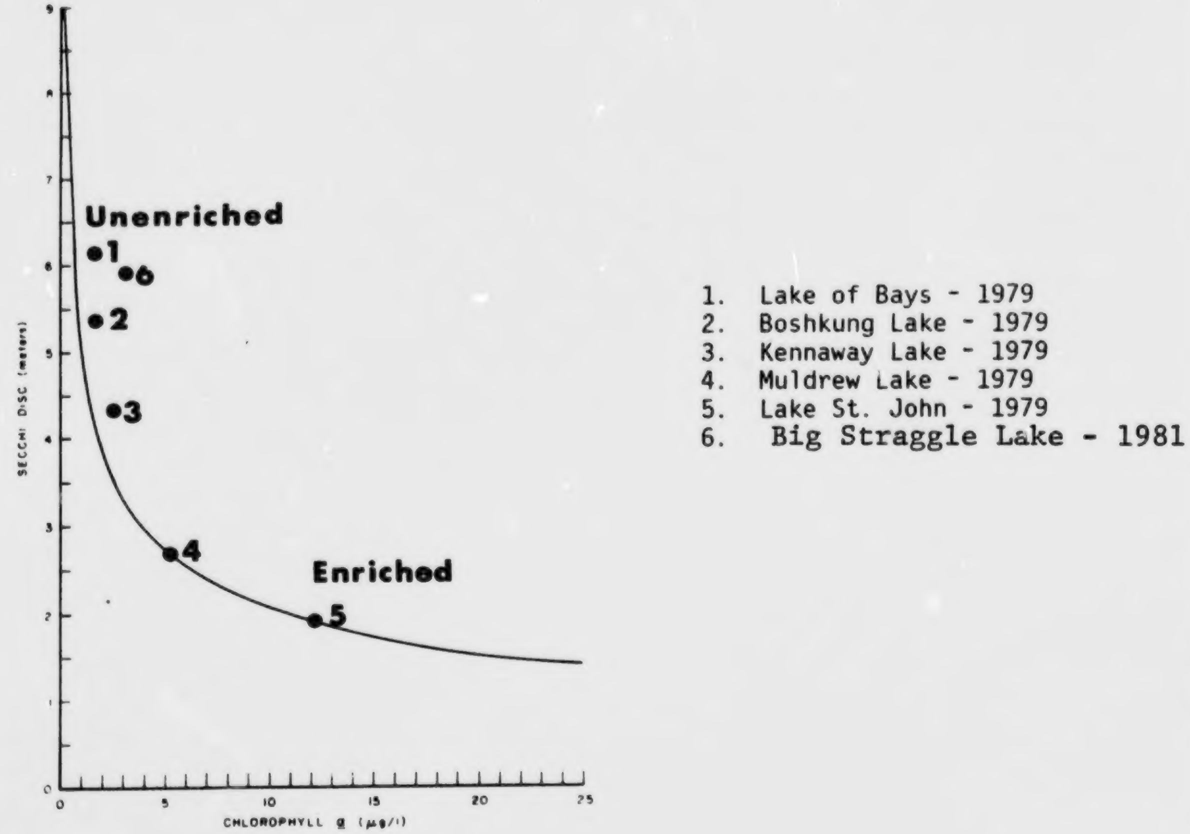
The Secchi disc readings ranged from 4.0 to 8.0m and the chlorophyll a concentrations ranged from 1.8 to 7.0 ug/L On May 25, when the highest Secchi disc reading was measured, concentrations of chlorophyll a were also at their peak. This would indicate that suspended algae was concentrated below the Secchi depth. Based on the seasonal means, Big Straggle would be considered moderately enriched with a high degree of water transparency and moderate densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Big Straggle Lake from 1971 to 1981.

Station	Main		Deep Basin	
Year	S.D.	Chl. a	S.D.	Chl.a
1971	3.8	2.1		
1972	-	-		
1973	4.6	4.0		
1974	4.8	1.4		
1975	6.0	1.7		
1976	4.5	1.8		
1977	5.7	-	4.7*	2.3*
1978	5.4	2.2		
1979	4.6	3.1		
1980	5.0	3.0		
1981	5.9	3.2		

* MOE - data

Figure 1: The relationship between Secchi disc and chlorophyll a for Big Straggle Lake and a number of recreational lakes in the province. All data are seasonal means.



Since 1971, an excellent Self-Help Program has been conducted on Big Straggle Lake. The degree of water transparency has generally increased over that period from 3.8m in 1971 to 5.9m in 1981. The densities of suspended algae have shown greater variation from year to year. The overall water quality of Big Straggle Lake continues to fluctuate between moderately enriched and unenriched. We hope that the enthusiastic participation in this program continues.

For additional copies of this report, please contact:

Ontario Ministry of the Environment, Central Region, 150 Ferrand Drive, DON MILLS, Ontario, M3C 3C3, Telephone: (416) 424-3000, Attention: Dhan Sharma

Black Lake
Wood Ward
Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Black Lake in 1980.

Station	South		North	
Date	S.D.	Chl.a	S.D.	Chl.a
June 14	1.3	3.6	1.0	4.9
June 20	1.5	5.4	1.5	4.8
June 28	--	5.8	- -	4.3
July 5	1.3	5.1	1.2	6.9
July 12	1.3	5.2	1.3	5.0
July 19	1.2	4.6	1.3	4.1
July 27	1.3	DM	1.3	DM
Aug. 3	1.3	4.3	1.1	4.5
Aug. 9	1.3	- -	1.1	0.5
Aug. 16	1.5	DM	1.4	DM
Aug. 24	1.6	6.0	1.2	7.5
Aug. 30	DM	4.8	DM	12.0
Sept. 7	1.5	52.0	1.3	11.0
Mean	1.4	9.7	1.2	6.0

D.M. - data missing

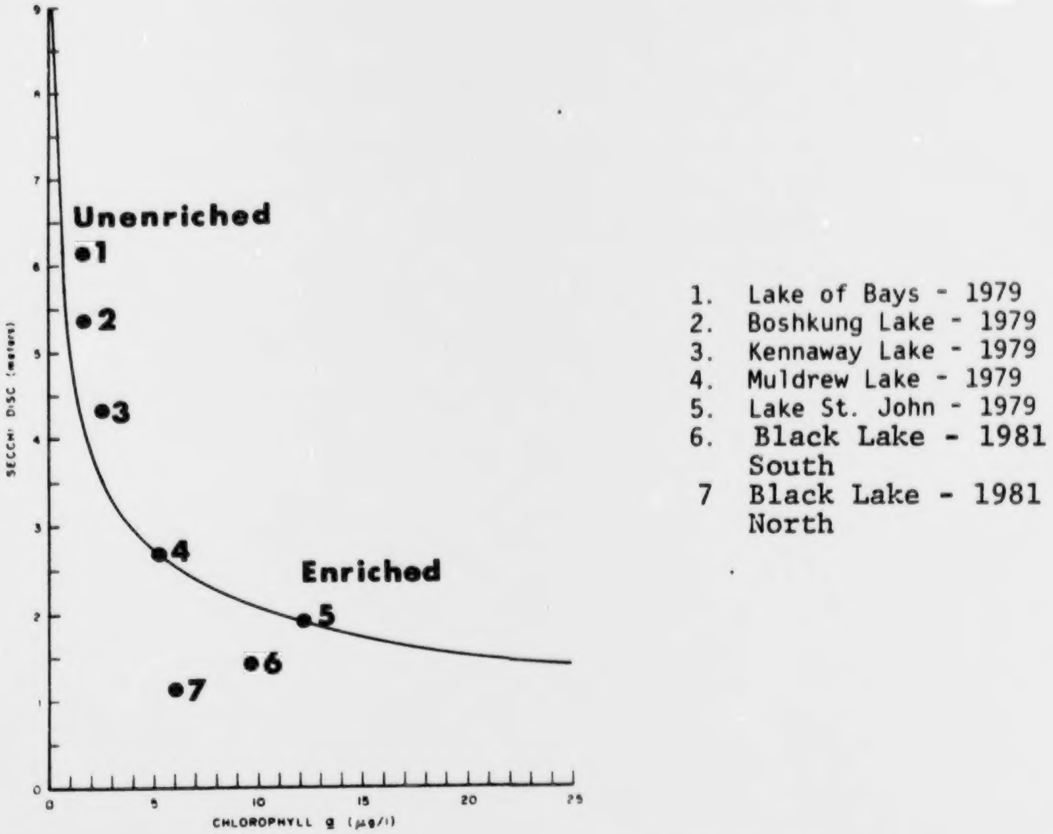
The Secchi disc readings remained relatively constant over the sampling period averaging 1.4m at the south station and 1.2m at the north station. Chlorophyll a concentrations in September increased to 52 ug/L at the south station and 11 ug/L at the north station. These levels indicate an algae "bloom". Based on the seasonal means for the two parameters measured, Black Lake would be considered enriched, characterized by a low degree of water transparency and high densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 season.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Black Lake from 1975 to 1981.

Station	Main		South		North	
Year	S.D.	Chl. a	S.D.	Chl. a	S.D.	Chl. a
1971						
1972						
1973						
1974						
1975	1.8*	3.8*	1.8*	4.1*	1.8	4.1
1976						
1977						
1978						
1979			1.3	8.4	1.3	9.0
1980			1.2	6.8	1.2	5.8
1981			1.4	9.7	1.2	6.0

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Black Lake and a number of recreational lakes in the province. All data are seasonal means.



An excellent sampling program was conducted on Black Lake this year. The results of this program indicate that the enrichment status of Black Lake has not changed. The algae bloom at the south station this past year increased the average chlorophyll a concentration from 5.0 uglL before the bloom to 9.7 uglL after the bloom. The cause of the algae bloom is not definite but was likely due to a combination of factors such as sunlight, nutrients and temperature which provided ideal conditions for growth. We recommend that participation in this program continue to determine whether the "bloom" this year indicates a trend in water quality.

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Boshkung Lake

Stanhope Township

Haliburton County

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Boshkung Lake in 1981.

Station	Main	
Date	S.D.	Chl. a
June 21	5.5	2.4
July 6	5.5	2.5
July 19	6.8	1.6
Aug. 23	5.8	1.9
Sept. 21	5.4	2.1
Mean	5.8	2.1

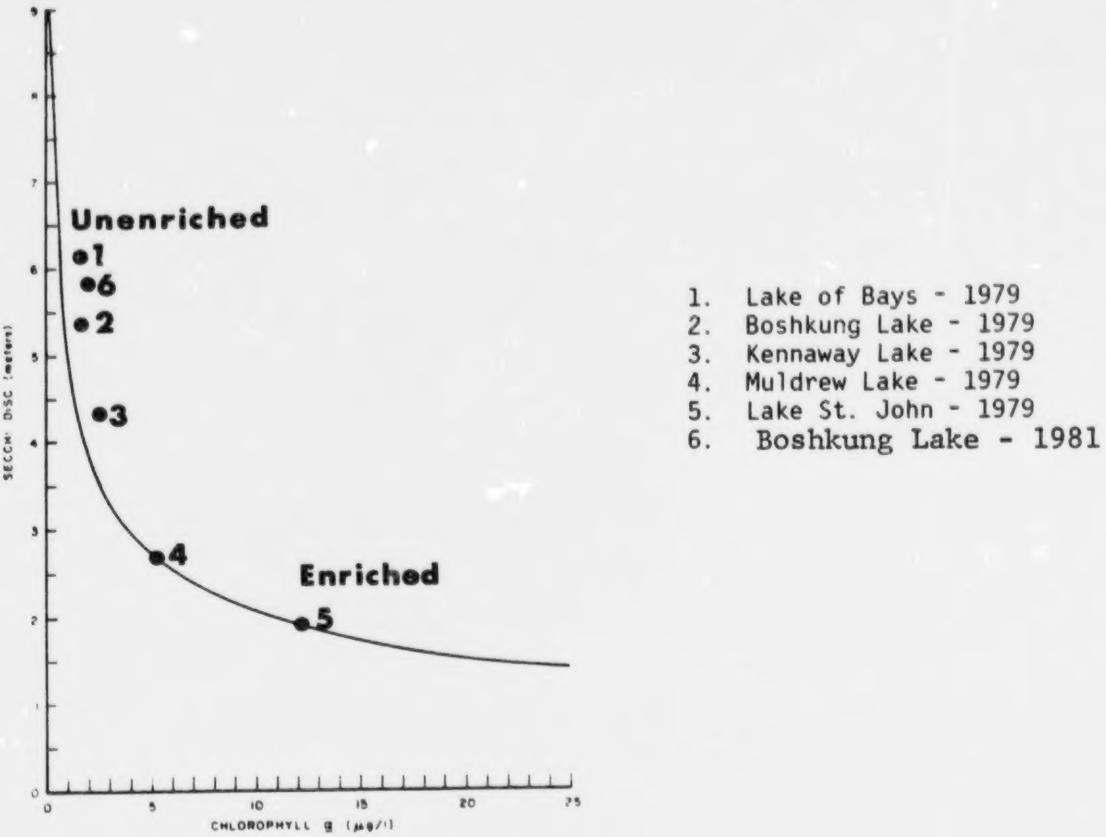
The Secchi disc readings ranged from 5.4 to 6.8m and chlorophyll a concentrations ranged from 1.6 to 2.5 ug/L during the sampling period. The highest degree of water transparency was measured on July 19 and corresponded to the lowest densities of suspended algae. Based on the seasonal means for the two parameters measured, Boshkung Lake would be considered unenriched, characterized by a high degree of water transparency and moderately low densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Boshkung Lake from 1972 to 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972	5.6	0.9
1973	5.6*	2.0*
1974	- -	0.9
1975	5.2*	1.4
1976	- -	- -
1977	6.6	- -
1978	- -	- -
1979	5.4	1.6
1980	4.6	2.3
1981	5.8 *	2.1 *

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Boshkung Lake and a number of recreational lakes in the province. All data are seasonal means.



Since 1972, the water quality in Boshkung Lake has remained relatively constant. It is felt that variations which have occurred in recent years are largely due to sampling frequency and period, for example, in 1980 and 1981, no samples were taken in May when densities of suspended algae are often low in unenriched lakes. Continued participation in this program is encouraged.

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Bruce Lake

Medora Ward

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Bruce Lake in 1981.

Station Date	A S.D.	 Chl. a
June 28	2.8	2.6
July 5	3.3	FT
July 19	3.3	DM
Aug. 3	3.5	2.4
Aug. 16	2.8	0.3
Aug. 30	3.0	2.6
Oct. 12	3.3	2.2
Mean	3.1	2.0

FT - Filter turbid, no data
DM - data missing

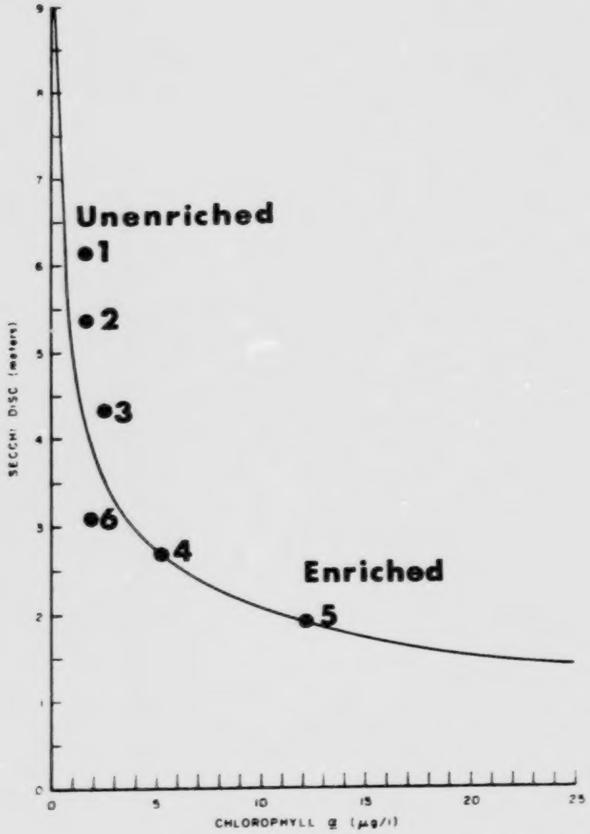
Secchi disc readings ranged from 2.8 to 3.5m and chlorophyll a concentrations ranged from 0.3 to 2.6 ug/L over the sampling period. Based on the seasonal means for the two parameters measured, Bruce Lake would be considered moderately enriched characterized by a moderate degree of water transparency and moderately low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Bruce Lake 1977 to 1981.

Station Year	A S.D.	 Chl.a
1971		
1972		
1973		
1974	3.4*	3.6*
1975	- -	- -
1976	- -	- -
1977	1.8*	- -
1978	3.6*	4.8*
1979	3.9	5.2
1980	3.8	4.8
1981	3.1	2.0 *

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Bruce Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Bruce Lake - 1981

Since 1977, water quality in Bruce Lake has remained relatively constant, however, in 1981, lower densities of suspended algae were observed. This could be due to the lack of data available for July, which is often characterized by high densities of suspended algae. We encourage continued participation in this program and we congratulate the cottagers of Bruce Lake for conducting an excellent sampling program on Bruce Lake again this year.

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Cameron Lake

Fenelon Township

Victoria County

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Cameron Lake in 1981.

Station	Fell's Bay	
Date	S.D.	Chl.a
May 24	4.90	1.5
June 7	4.75	1.7
20	5.0	1.6
Aug. 3	3.1	DM
Mean	4.4	1.6

DM - data missing

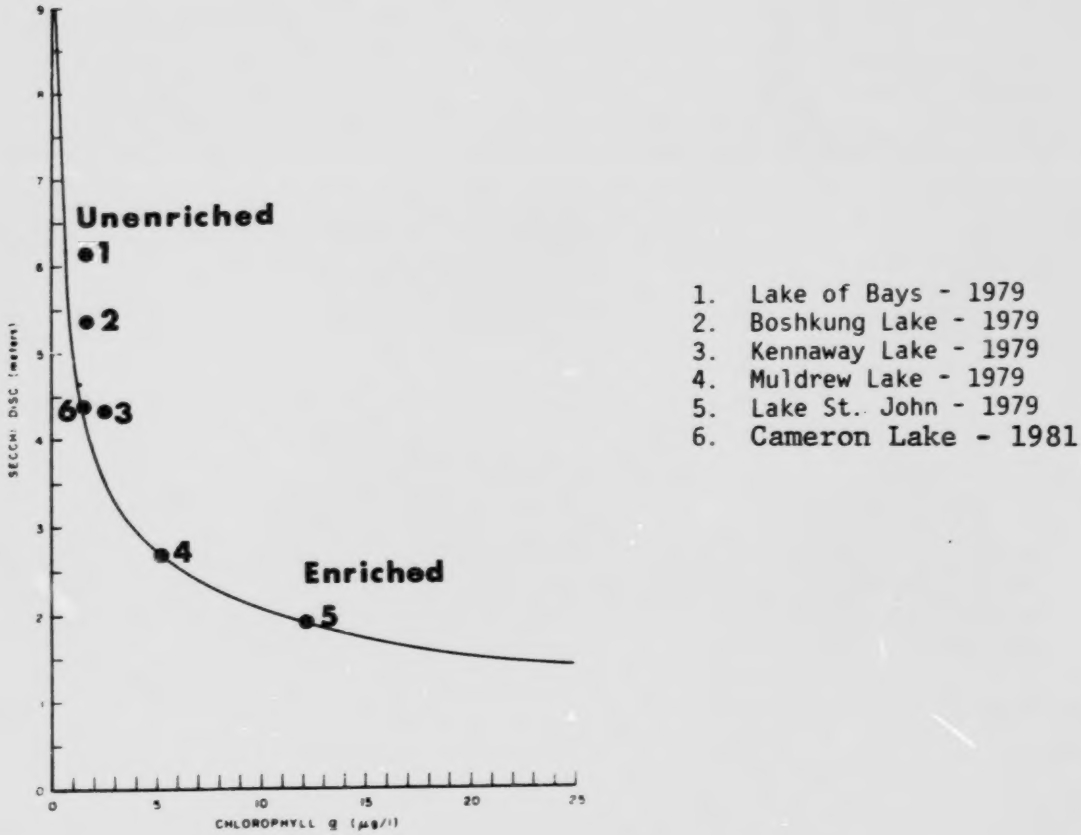
Based on the average values of our sampling runs taken during 1981, Cameron Lake is considered poorly enriched with a moderate degree of water clarity and a favourably low algal density. It is suggested that at least six samples be taken through the ice free period in order to get a more reliable seasonal mean.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Cameron Lake in 1981.

Station	Fell's Bay	
Year	S.D.	Chl.a
1971 *	3.9	2.8
1972 *	3.8	2.8
1973 *	5.0	2.6
1974		
1975		
1976 *	3.7	1.9
1977		
1978		
1979		
1980		
1981	4.4**	1.6**

* MOE sampling at mid-lake
** Based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll *a* for Cameron Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Cameron Lake - 1981

In comparing the 1981 results to those gathered by MOE staff in past years, it appears that a gradual improvement in the water quality of Cameron Lake may be taking place. Continued participation in the program is encouraged to confirm long-term trends.

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Canning Lake

Minden & Snowdon Townships
Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Canning Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
June 21	4.0	4.3
June 28	3.5	4.3
July 5	3.6	4.4
July 12	3.7	2.7
July 19	5.5	2.2
July 26	4.5	D.M.
Aug. 3	4.5	D.M.
Aug. 9	4.5	2.7
Aug. 16	- -	1.6
Aug. 23	4.5	1.7
Aug. 30	4.0	2.1
Mean	4.2	2.9

D.M. - data missing

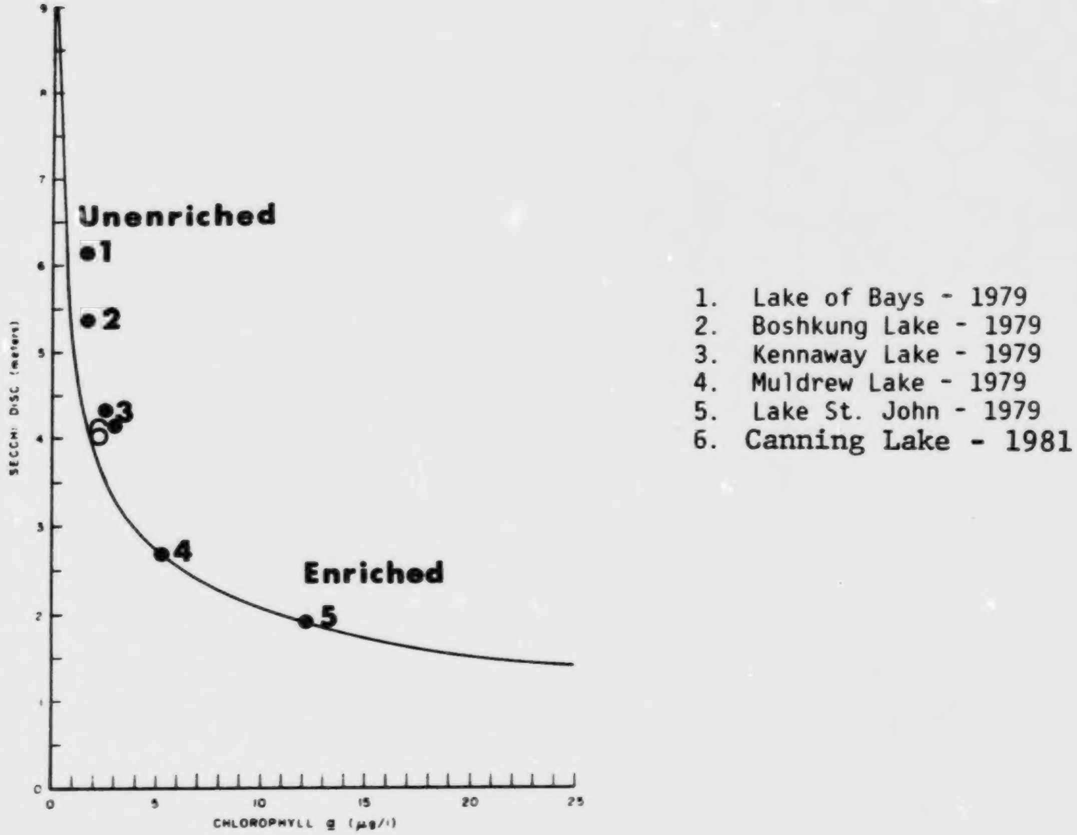
Secchi disc readings ranged from 3.5 to 5.5 m and chlorophyll a concentrations ranged from 1.6 to 4.4 ug/L during the sampling period. Based on the seasonal means for the two parameters measured, Canning Lake would be considered moderately enriched with a moderate degree of water transparency and moderate densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Canning Lake from 1972 to 1981.

Station	Main		Deep Basin	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972	4.6	3.0		
1973	5.6	1.8		
1974	4.8	1.6		
1975	4.9	1.6		
1976	5.6	1.9	5.4*	2.0*
1977	5.5	- -		
1978	4.4	2.3		
1979	4.3	2.4		
1980	3.8	2.3		
1981	4.2	2.9		

* MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Canning Lake and a number of recreational lakes in the province. All data are seasonal means.



Once again, an excellent program was conducted on Canning Lake in 1981. Since 1972, the water quality has remained relatively constant. The average Secchi disc readings have ranged from 3.8 to 5.6m and average chlorophyll a concentrations ranged from 1.6 to 3.0 ug/L. We hope that participation in this program continues in order to maintain the excellent historical record of water quality in Canning Lake.

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Chandos Lake

Chandos Township

Peterborough County

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Chandos Lake in 1981.

Station Date		Main Lake (Southend) S.D.	Chl.a	Gilmour Bay S.D.	Chl.a
May	19	3.2	4.6	3.0	4.9
June	6	4.0	1.7	3.5	- -
July	8	3.8	1.3	3.5	3.9
Aug.	10	3.8	1.6	3.0	4.0
	31	7.5	1.0	6.5	1.0
Sept.	21	4.25	1.9	4.0	2.3
Oct.	14	5.0	2.2	4.5	2.0
Mean		4.5	2.0	4.0	3.0

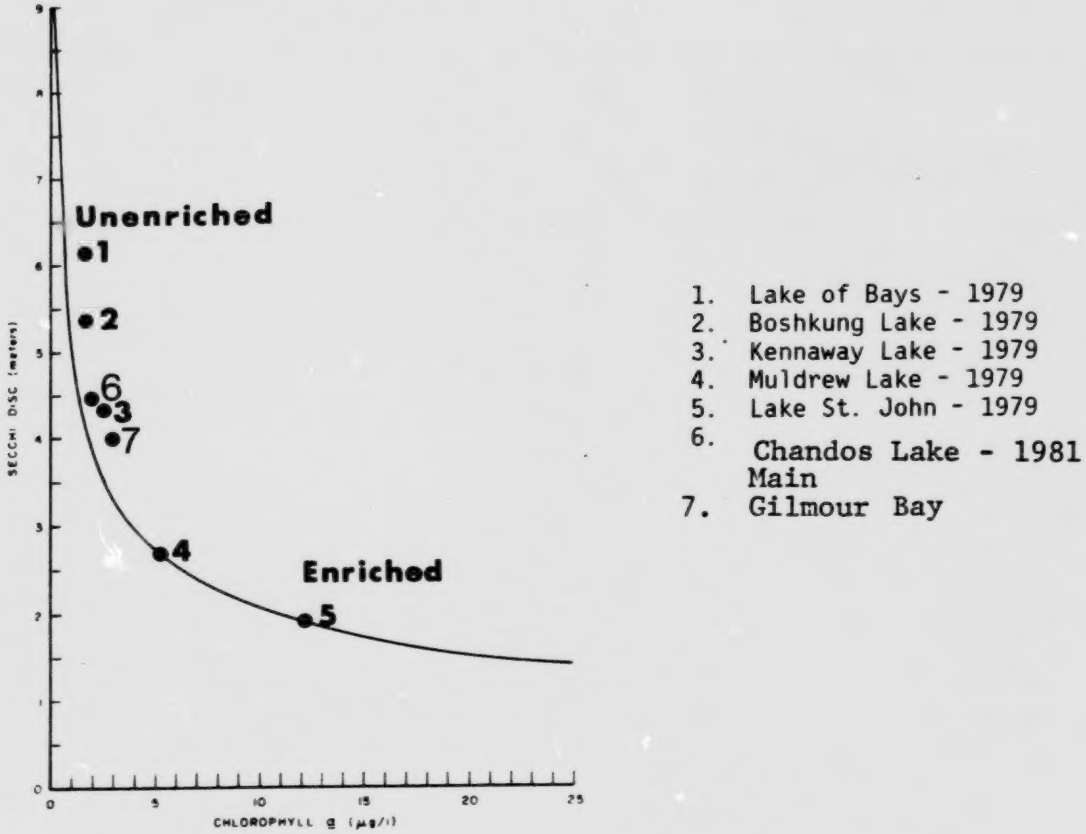
The individual values shown in Table 1 for the main lake indicate a decrease in algal density in spring to a favourably low level ending in a slight increase in fall. A similar pattern is not evident for Gilmour Bay. Based on the mean values for the two parameters the main part of Chandos Lake is considered poorly enriched with low algal density and a moderately high degree of water clarity. Gilmour Bay is considered moderately enriched but has slightly poorer water clarity and higher algal density than the main lake.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Chandos Lake from 1972 to 1981.

Station Year	South Bay (1) S.D.	Chl.a	Gilmour Bay S.D.	Chl.a	North End S.D.	Chl.a	South End S.D.	Chl.a
1971								
*1972	3.6	2.0						
**1973	4.9	1.7						
*1974	4.0	1.2						
T 1975	5.2	2.3						
1976	4.0	2.2	3.3	5.2				
1977	4.6	- -	4.4	- -				
1978	4.1	2.6	4.1	4.4	4.1	2.6	4.3	2.7
1979	- -	- -	3.0	3.9	- -	- -	3.5	2.2
1980	- -	- -	3.4	4.8	- -	- -	3.5	2.5
1981	- -	- -	4.0	3.0	- -	- -	4.5	2.0

*Mean of 4 stations ** Mean of 3 stations T Based on 1 set of data.

Figure 1: The relationship between Secchi disc and chlorophyll *a* for Chandos Lake and a number of recreational lakes in the province. All data are seasonal means.



No year to year trend in the data shown in Table 2 is apparent. Continued participation in the sampling program is recommended.

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Clear Lake

Oakley Ward

Town of Bracebridge

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Clear Lake in 1981.

Station	Mid Lake	
Date	S.D.	Chl. a
May 3	7.2	4.2
May 31	7.0	1.8
June 15	6.7	1.8
June 28	7.2	2.2
July 12	6.7	1.9
Aug. 4	6.7	DM
Sept.7	8.0	1.4
Oct. 4	6.5	2.0
Mean	7.0	2.2

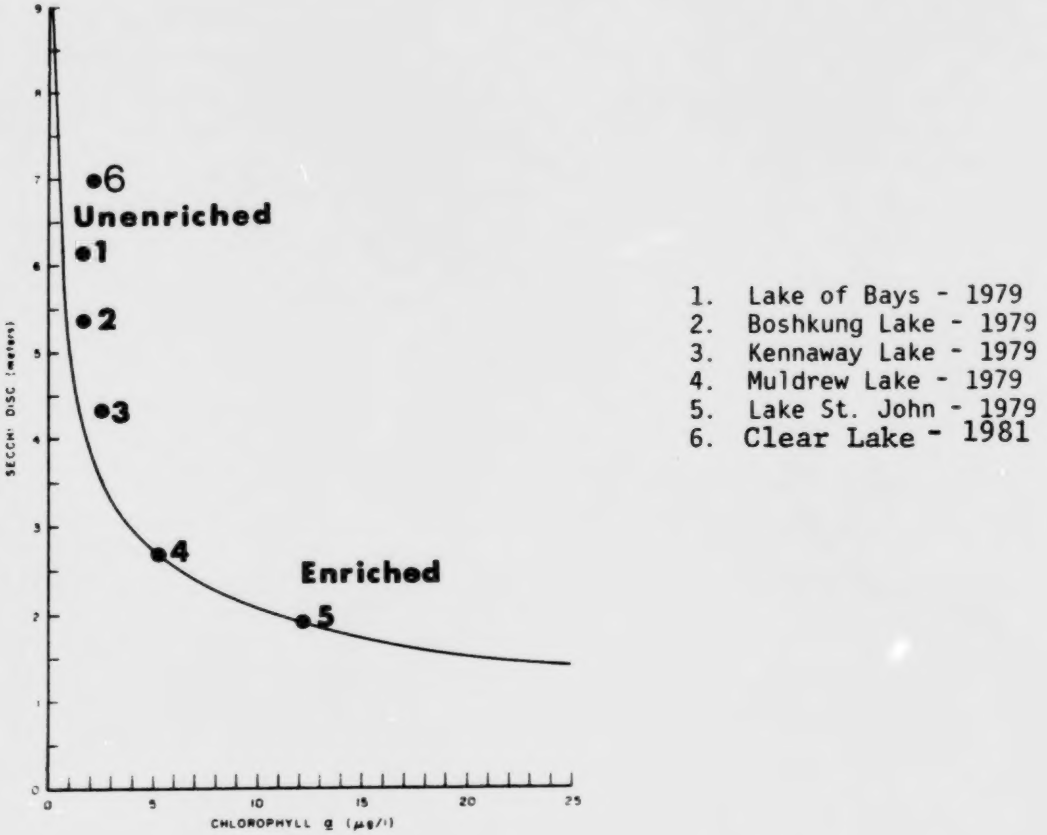
D.M. - data missing

The Secchi disc readings ranged from 6.5 to 8.0 m and chlorophyll a concentrations ranged from 1.4 to 4.2 ug/L during the sampling period. Based on the seasonal means for the two parameters measured, Clear Lake would be considered unenriched, characterized by a high degree of water transparency and moderately low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Clear Lake from 1977 to 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977	7.1	- -
1978	6.6	1.5
1979	7.1	2.3
1980	6.8	2.0
1981	7.0	2.2

Figure 1: The relationship between Secchi disc and chlorophyll a for Clear Lake and a number of recreational lakes in the province. All data are seasonal means.



Once again, an excellent sampling program was conducted on Clear Lake this past year. As in previous years, water quality conditions in 1981 were excellent. Average Secchi disc readings have ranged from 6.6 to 7.1 m and average chloraphyll a concentrations have ranged from 1.5 to 2.3 ug/L. We hope that participation in this program continues in order to determine whether this stable lake condition persists.

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Clearwater Lake

Morrison Ward
Town of Gravenhurst
District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Clearwater Lake in 1981.

Station	1	
Date	S.D.	Chl.a
June 7	3.0	5.2
June 21	5.75	2.9
July 6	5.75	3.1
July 27	6.0	2.4
Aug. 8	6.0	LA
Aug. 23	6.0	1.6
Mean	5.4	3.0

L.A. - lab accident

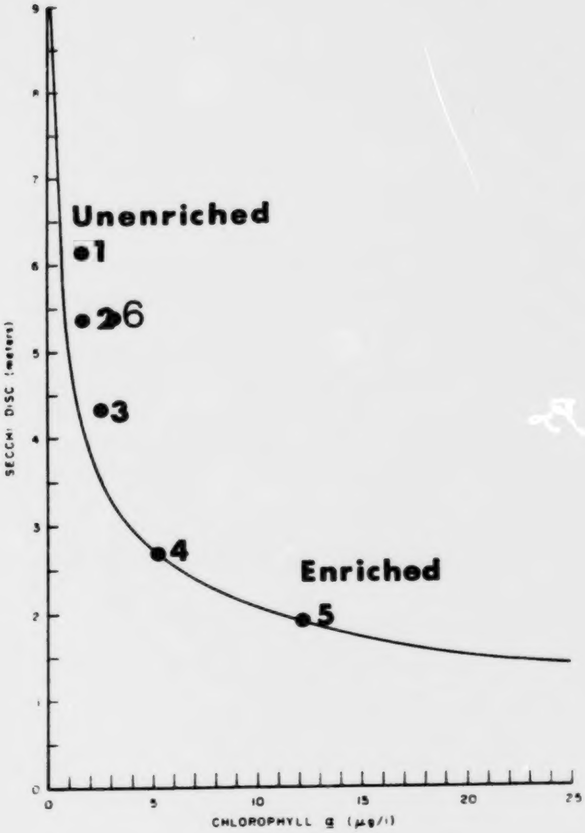
The Secchi disc readings ranged from 3.0 to 6.0 m and chlorophyll a concentrations ranged from 1.6 to 5.2 ug/L during the sampling period. The highest degree of water transparency occurred in late summer and corresponded to the lowest densities of suspended algae. Based on the seasonal means for the two parameters measured, Clearwater Lake would be considered unenriched, characterized by a high degree of water transparency and moderate densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Clearwater Lake from 1975 to 1980.

Station	1	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975	4.3	1.5
1976	5.4	1.8
1977	5.3	- -
1978	5.9*	2.5*
1979	5.5	3.4
1980	5.6	2.6
1981	5.4	3.0*

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Clearwater Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Clearwater Lake - 1981

Since 1975, the degree of water transparency in Clearwater Lake has not changed significantly. The average chlorophyll a concentration has increased from 1.5 ug/L in 1975 to 3.0 ug/L in 1981. We would recommend that participation in this program continue to determine if this indicates a long-term trend in water quality.

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Davis Lake

Lutterworth Township
Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Davis Lake in 1981.

Station	1. Deep Bay - south off Island	
Date	S.D.	Chl.a
May 19	3.0	1.2
June 26	4.5	2.7
Aug. 3	- -	1.9
Aug. 23	4.5	1.9
Mean	4.0	1.9

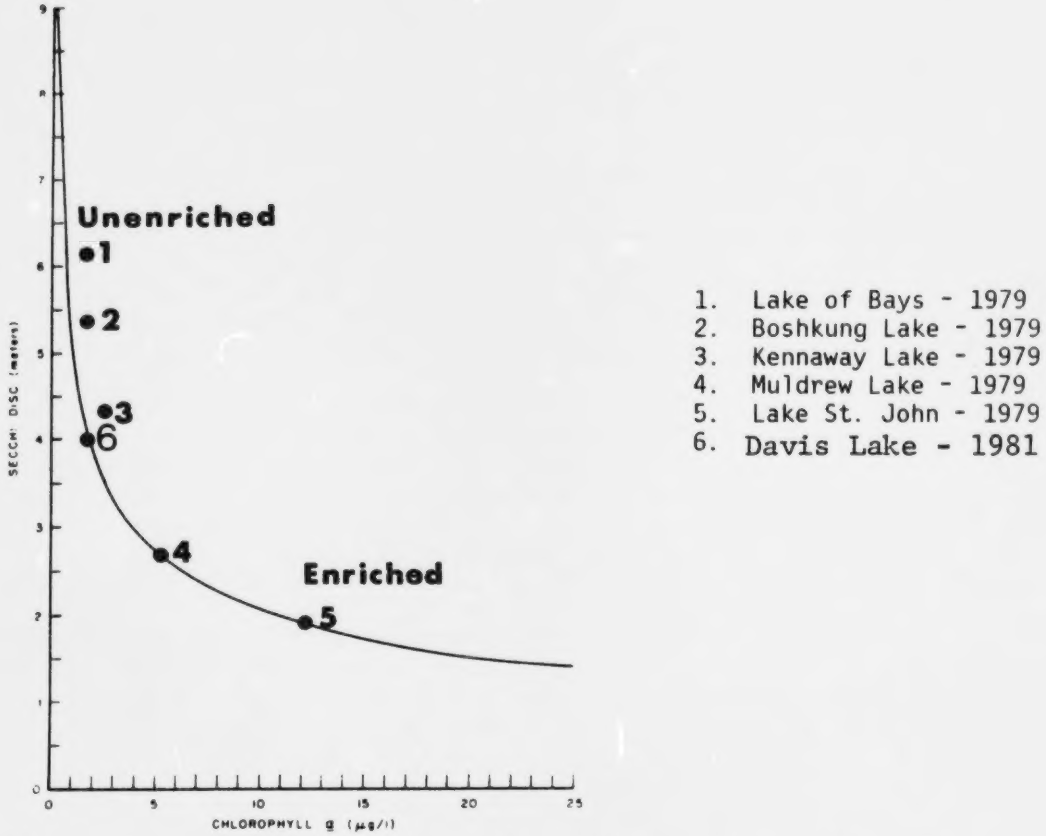
The Secchi disc readings ranged from 3.0 to 4.5 m and chlorophyll a concentrations ranged from 1.2 to 2.7 ug/L. On Aug. 3, the Secchi disc reading was not written on the submission sheet so that data is missing. Based on the seasonal means available, Davis Lake would be considered unenriched, characterized by a moderate degree of water transparency and low densities of suspended algae. The other 4 stations sampled were not included in the summary because each station was only sampled once. For next year's program, we recommend that one or two sampling stations be selected and sampled at least six times during the ice-free period.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Davis Lake from 1972 to 1981.

Station	Main		Deep Bay	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972	4.6	1.9		
1973	4.9*	3.7*		
1974	3.6*	1.4*		
1975	3.8	3.9		
1976	4.9*	2.2*		
1977	4.3*	- -		
1978	- -	- -		
1979	- -	- -		
1980	- -	- -		
1981	- -	- -	4.0*	1.9*

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Davis Lake and a number of recreational lakes in the province. All data are seasonal means.



In 1981, the water quality in Davis Lake was comparable to water quality from 1972 to 1977. It is not clear whether the Deep Bay sampled in 1981 is the same location as the Main station sampled in the past. The condition of Davis Lake appears to be stable. We recommend continued participation in this program to monitor any changes in water quality.

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Doeskin Lake

Muskoka Ward

Town of Gravenhurst

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Doeskin Lake in 1981.

Station	1.	
Date	S.D.	Chl.a
June 7	- -	7.4
June 21	1.25	3.9
July 5	1.4	5.4
12	1.25	3.2
19	1.25	DM
Aug. 3	1.25	3.6
9	1.25	1.9
Sept. 1	1.5	13.0
Mean	1.3	5.5

D.M. - data missing

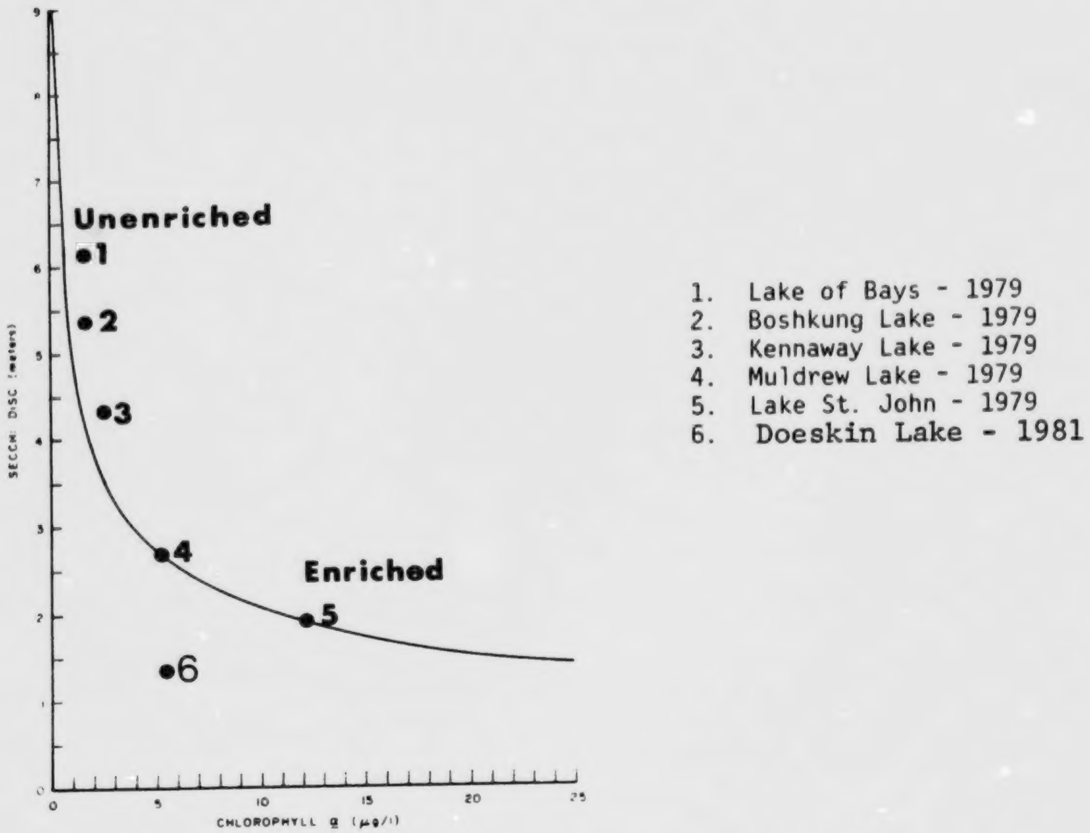
The Secchi disc reading ranged from 1.25 to 1.5 m and chlorophyll a concentrations ranged from 1.9 to 13.0 ug/L during the sampling program. On June 7, the Secchi disc reading was not included on the submission sheet. On Sept. 1, chlorophyll a concentrations were high indicating high densities of suspended algae. Based on the seasonal means, Doeskin Lake would be considered enriched, characterized by a low degree of water transparency and high densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Doeskin Lake from 1978 to 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977		
1978	1.2	4.5
1979	- -	11.0*
1980	1.3	7.0
1981	1.3	5.5

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Doeskin Lake and a number of recreational lakes in the province. All data are seasonal means.



Once again, an excellent sampling program was conducted in 1981. In the past four years, water quality in Doeskin Lake has remained relatively constant. Because it is an enriched lake, Doeskin Lake experiences frequent problems with high densities of suspended algae. This results in fluctuation of average chlorophyll a concentrations from year to year. We hope that participation in this program continues in order to monitor any changes in water quality.

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Drag Lake

Dudley & Dysart Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Drag Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
July 12	6.7	2.4
19	6.7	2.5
27	6.1	DM
Aug. 3	6.1	DM
9	6.1	4.3
17	6.1	1.2
24	7.0	1.2
31	7.3	2.2
Sept. 8	7.6	2.1
Mean	6.6	2.3

D.M. - data missing

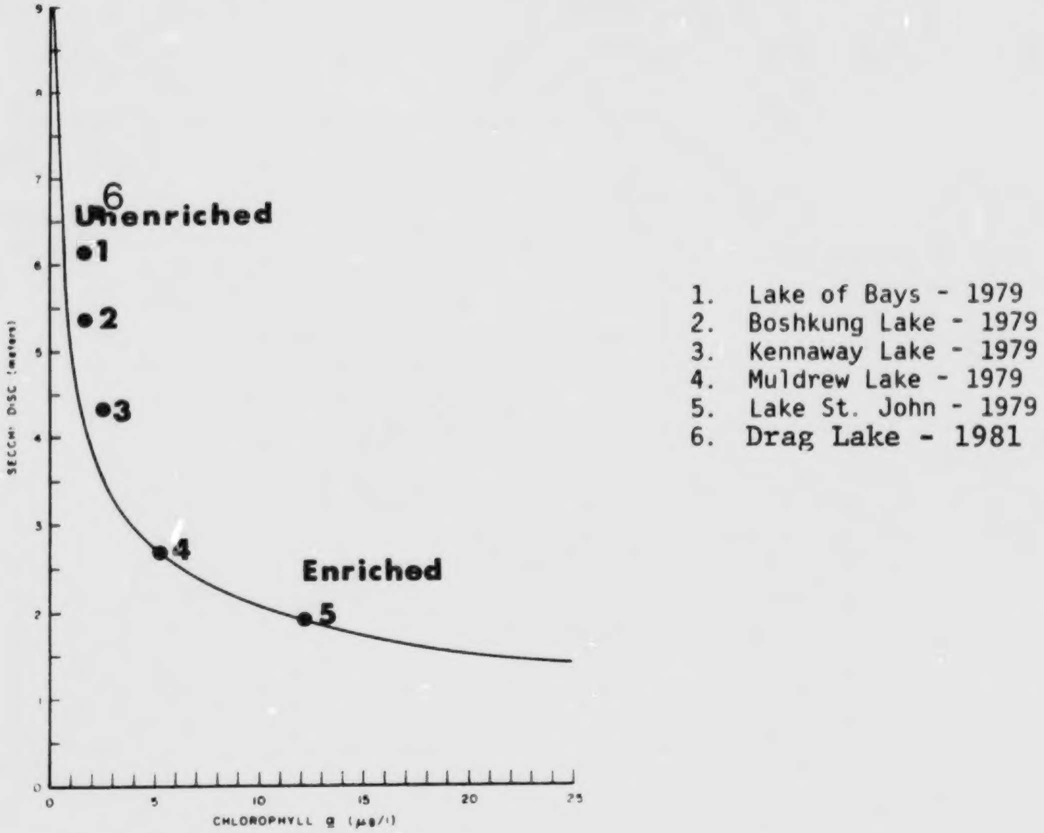
The Secchi disc readings ranged from 6.1 to 7.6 m and chlorophyll a concentrations ranged from 1.2 to 4.3 ug/L. The degree of water transparency remained consistently high during the sampling period. Based on the seasonal means, Drag Lake would be considered unenriched, characterized by a high degree of water transparency and moderately low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Drag Lake from 1973 to 1981.

Station	Main		Deep Basin	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973	6.0	2.9		
1974	6.2**	0.6**		
1975	6.8**	1.4**		
1976	5.8	2.4		
1977	6.4	- -	6.2*	1.3*
1978	6.3	1.7		
1979	5.9	2.3		
1980	5.8	2.2		
1981	6.6	2.3		

* MOE data
** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Drag Lake and a number of recreational lakes in the province. All data are seasonal means.



Once again, an excellent sampling program was conducted on Drag Lake in 1981. Since 1973, water quality has remained relatively constant. Average Secchi disc readings ranged from 5.8 to 6.8 m and average chlorophyll a concentrations ranged from 0.6 to 2.9 ug/L. There is no apparent trend to indicate that the water quality condition is changing. We hope that participation in this program continues.

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Ontario Ministry of the Environment, Central Region, 150 Ferrand Drive, DON MILLS, Ontario, M3C 3C3, Telephone: (416) 424-3000, Attention: Dhan Sharma

Dummer Lake

Dummer Township

Peterborough County

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Dummer Lake in 1981.

Station	South End	
Date	S.D.	Chl.a
May 18	3.8	2.6
24	4.5	1.0
June 14	3.5	3.9
29	3.8	5.3
July 12	4.0	1.7
July 26	3.5	11.0
Aug. 16	2.8	3.8
23	3.8	1.3
Sept. 7	3.3	4.0
Mean	3.7	3.8

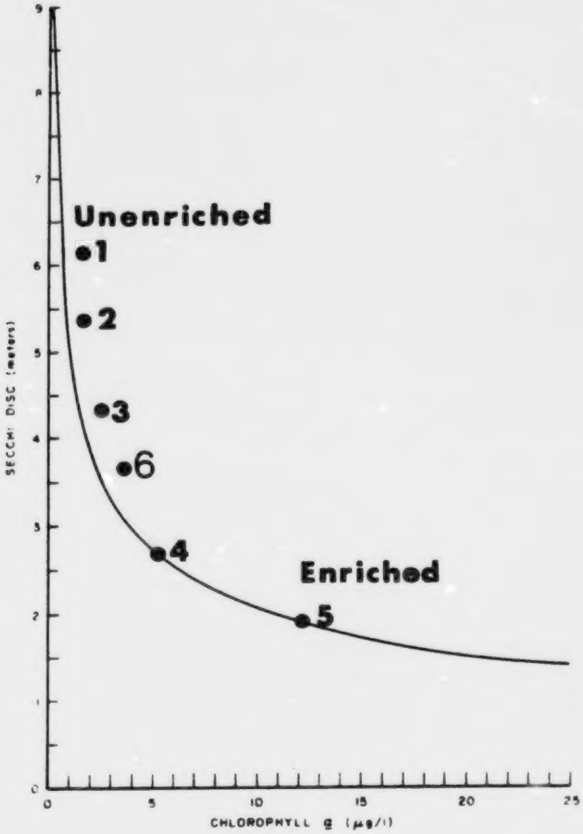
A very good sampling program was undertaken during 1981. Minor fluctuations in the parameters shown in Table 1 were noted over the sampling period. Based on the mean Secchi disc and chlorophylla values Dummer Lake is considered moderately enriched with moderate algal densities and a moderate degree of water transparency.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Dummer Lake from 1978 to 1981.

Station	1- South End	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977		
1978	3.2 (*3.8)	2.8 (*3.9)
1979	3.2	3.7
1980	3.1	3.5
1981	3.7	3.8

*Mean values from MOE/7 Links Water Quality Survey 1978.

Figure 1: The relationship between Secchi disc and chlorophyll a for Dummer Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Dummer Lake - 1981

No distinct trend in enrichment status for the lake is apparent for the sampling record since 1978. Continued participation in the sampling program is encouraged.

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East Lake

Harcourt Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from East Lake in 1981.

Station Date	Main S.D.	 Chl.a
June 1	4.5	2.9
7	4.0	DM
22	4.0	3.7
28	3.5	3.8
July 12	3.5	3.0
16	3.5	1.8
26	3.75	DM
Aug. 3	3.25	DM
16	3.5	1.8
Mean	3.7	2.8

DM - data missing

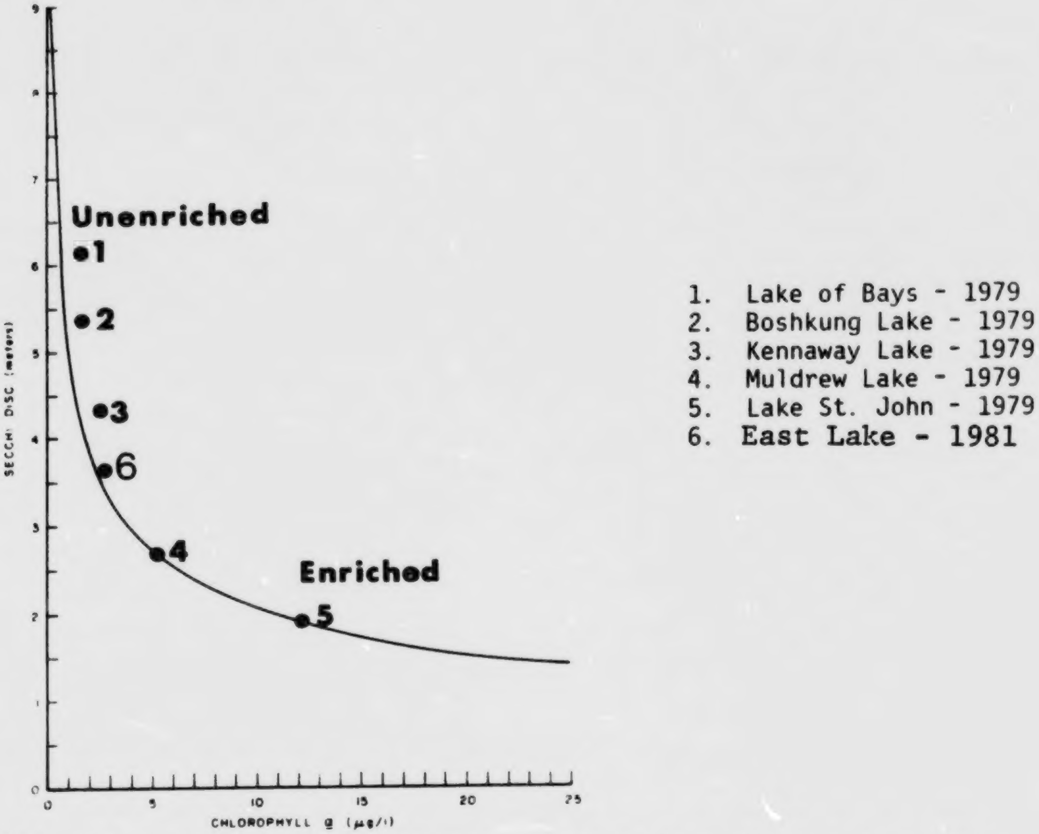
The Secchi disc readings ranged from 3.25 to 4.5 m and chlorophyll a concentrations ranged from 1.8 to 3.8 ug/L during the sampling period. Based on the seasonal means, East Lake would be considered moderately enriched, characterized by a moderate degree of water transparency and moderately low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from East Lake from 1971 to 1981.

Station Year	Main S.D.	 Chl.a
1971	4.3	2.7
1972	- -	- -
1973	5.0*	1.9*
1974	3.6	1.5
1975	4.2	2.2
1976	4.2	2.3
1977	4.2	- -
1978	4.6	2.3
1979	4.6	2.7
1980	4.6	2.8
1981	3.7	2.8

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for East Lake and a number of recreational lakes in the province. All data are seasonal means.



In 1981, an excellent program was conducted on East Lake. We now have a 10 year historical record on water quality in East Lake. Since 1971, average Secchi disc readings have remained relatively constant ranging from 3.6 to 4.6 m and average chlorophyll a concentrations ranged from 1.5 to 2.8 ug/L. The small amount of variation over a 10 year period indicates a stable lake condition. We hope that participation in this program continues.

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Farlain Lake

Tiny Township

Simcoe County

TABLE 1: Secchi Disc (m) and chlorophyl a (ug/L) data collected from Farlain Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
Aug. 15	- -	1.4

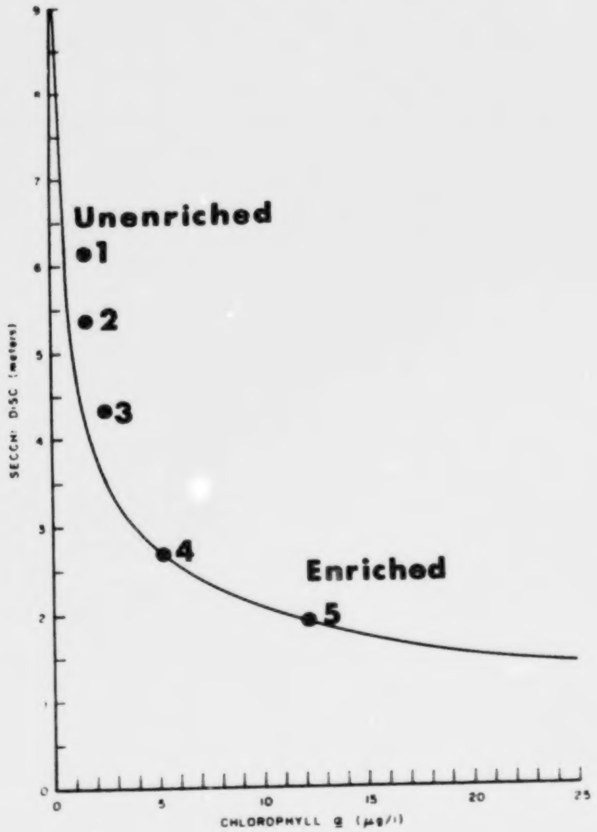
Secchi disc reading not given.
Insufficient sampling was done to make reliable conclusions.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Farlain Lake from 1973 to 1981.

Station Year	S.D.	Chl.a
1971		
1972		
1973	3.9*	2.2*
1974		
1975		
1976		
1977		
1978	3.7	2.3
1979	G4.0	1.7
1980	G4.0	2.2
1981	- -	1.4**

G - Secchi disc on bottom, reading higher than noted
* MOE data
** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6.

We hope that sampling frequency increases in the 1982 program.

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George's Lake

Harcourt Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from George's Lake in 1981.

Station		Main	
Date		S.D.	Chl.a
June	21	2.0	13.0
	28	1.5	11.0
July	5	1.75	9.7
	12	1.75	9.1
	19	2.25	D.M.
Aug.	3	1.75	D.M.
	9	1.75	6.9
	23	2.25	6.6
Sept.	7	2.10	7.4
Mean		1.9	9.1

D.M. - data missing

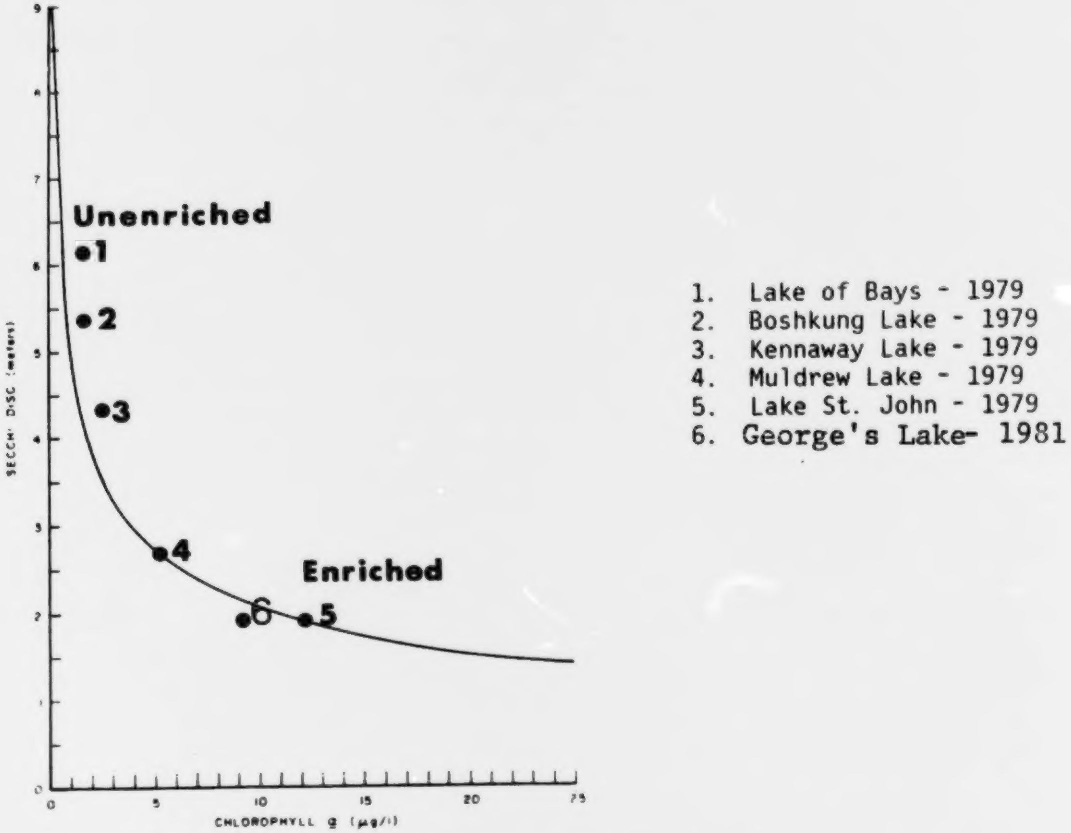
The Secchi disc readings ranged from 1.5 to 2.25 m and chlorophyll a concentrations ranged from 6.6 to 13.0 ug/L during the sampling period. The highest densities of suspended algae were observed in June and July. Based on the seasonal means for the two parameters measured, George's Lake would be considered enriched, characterized by a low degree of water transparency and high densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from George's Lake from 1973 to 1981.

Station	Main		"O"	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973	2.2*	5.8*	- -	- -
1974	2.3	3.0	2.2*	3.9*
1975	2.5	10.2	2.0*	6.4*
1976	2.6	7.2	- -	- -
1977	2.8	- -	- -	- -
1978	2.6	10.3	- -	- -
1979	2.5	10.7	- -	- -
1980	1.8	12.1	- -	- -
1981	1.9	9.1	- -	- -

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for George's Lake and a number of recreational lakes in the province. All data are seasonal means.



Once again this year, an excellent sampling program was conducted on George's Lake. We now have nine years of data for the main station which shows that the enrichment status of George's Lake has not changed significantly since 1973. We hope that participation in this program continues in order to determine if this stable lake condition persists.

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DON MILLS, Ontario, M3C 3C3, Telephone: (416) 424-3000, Attention: Dhan Sharma

Gibson Lake

Gibson Ward

Township of Georgian Bay

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Gibson Lake in 1981.

Station Date	A S.D.	 Chl.a
May 25	3.2	0.9
July 26	3.0	D.M.
Aug. 17	4.0	3.5
Oct. 4	2.5	2.9
Mean	3.2	2.4

D.M. - data missing

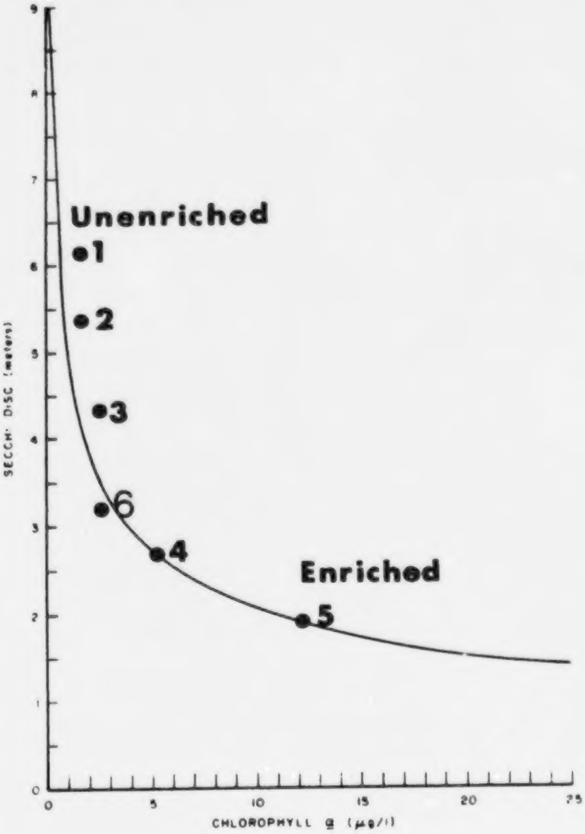
The Secchi disc readings ranged from 2.5 to 4.0 m and chlorophyll a concentrations ranged from 0.9 to 3.5 ug/L. We recommend that the sampling frequency be increased in order to obtain a reliable seasonal mean. Based on the information available, Gibson Lake would be considered moderately enriched characterized by a moderate degree of water transparency and moderately low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Gibson Lake from 1978 to 1981.

Station	A		Deep Basin	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973				
1974				
1975				
1976				
1977				
1978	3.5*	3.8*		
1979	3.4*	4.7*		
1980	2.6*	9.9*		
1981	3.2*	2.4*	2.1**	3.2**

* based on less than 6 samples
** MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Gibson Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Gibson Lake - 1981

Gibson Lake has been sampled for the past four years and the results indicate that the degree of water transparency has remained relatively constant while the densities of suspended algae have exhibited a great deal of variation from year to year. In 1981, algal densities were quite low compared to 1980 levels of 9.9 ug/L, however, the high 1980 levels were due primarily to an algae bloom in May which resulted in a high chlorophyll a concentration. In 1981, no severe algae blooms occurred. We hope that participation in this program continues in order to monitor any long-term water quality changes.

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Go Home Lake

Gibson Ward

Township of Georgian Bay

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Go Home Lake in 1981.

Station Date	A (North) S.D.	A (North) Chl.a	B (South) S.D.	B (South) Chl.a
May 31	4.0	2.2	3.5	2.6
June 24	5.5	1.2	5.0	1.6
July 27	5.0	DM	5.5	DM
Aug. 16	- -	0.3	- -	1.3
Mean	4.8	1.3	4.7	1.8

DM - data missing

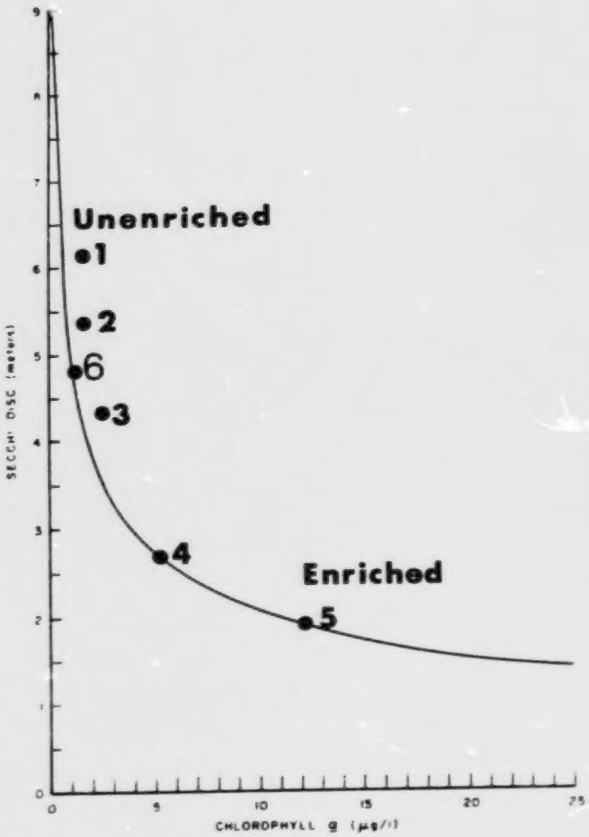
The Secchi disc readings ranged from 4.0 to 5.5 m at the north end and from 3.5 to 5.5 m at the south end. The chlorophyll a concentrations ranged from 0.3 to 2.2 ug/L at the north end and from 1.3 to 2.6 ug/L at the South end. There was little difference in enrichment status evident between the two stations. We would recommend more frequent sampling be done in order to obtain a reliable seasonal mean. Based on the seasonal means available, Go Home Lake would be considered unenriched, characterized by a moderately high degree of water transparency and low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Go Home Lake from 1971 to 1981.

Station Year	A (North) S.D.	A (North) Chl.a	B (South) S.D.	B (South) Chl.a
1971	3.6	1.4		
1972				
1973				
1974				
1975				
1976	5.6	1.9	5.4	2.3
1977	6.2*	- -	5.1*	- -
1978	- -	- -		
1979	4.6	2.6	4.8	3.2*
1980	- -	- -	- -	- -
1981	4.8*	1.3*	4.7*	1.8*

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Go Home Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Go Home Lake A-North - 1981

We now have five years of data for Go Home Lake. This data indicates that the enrichment status has fluctuated between unenriched and moderately enriched. We recommend that this program be continued for a number of years to determine the long-term water quality trends.

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Haliburton Lake

Harburn Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Haliburton Lake in 1981.

Station	Main-North End		South Bay	
Date	S.D.	Chl.a	S.D.	Chl.a
May 18	- -	1.3	3.75	1.9
May 24	8.5	0.9	3.75	2.5
May 31	8.0	1.4	4.5	DM
June 7	7.0	1.4	4.0	4.9
14	- -	2.2	- -	2.8
22	- -	- -	3.5	2.8
July 5	7.5	1.5*	4.25	4.0
12	7.0	1.4	4.75	4.4
19	6.5	2.3	4.75	4.2
Aug. 3	5.5	DM	4.50	DM
16	4.0	1.6	- -	- -
23	5.0	1.8	4.25	3.1
31	8.0	1.9*	- -	- -
Sept.8	8.0	1.7*	4.25	5.6
Mean	6.8	1.6	4.20	3.6

DM - data missing
* - no station location given

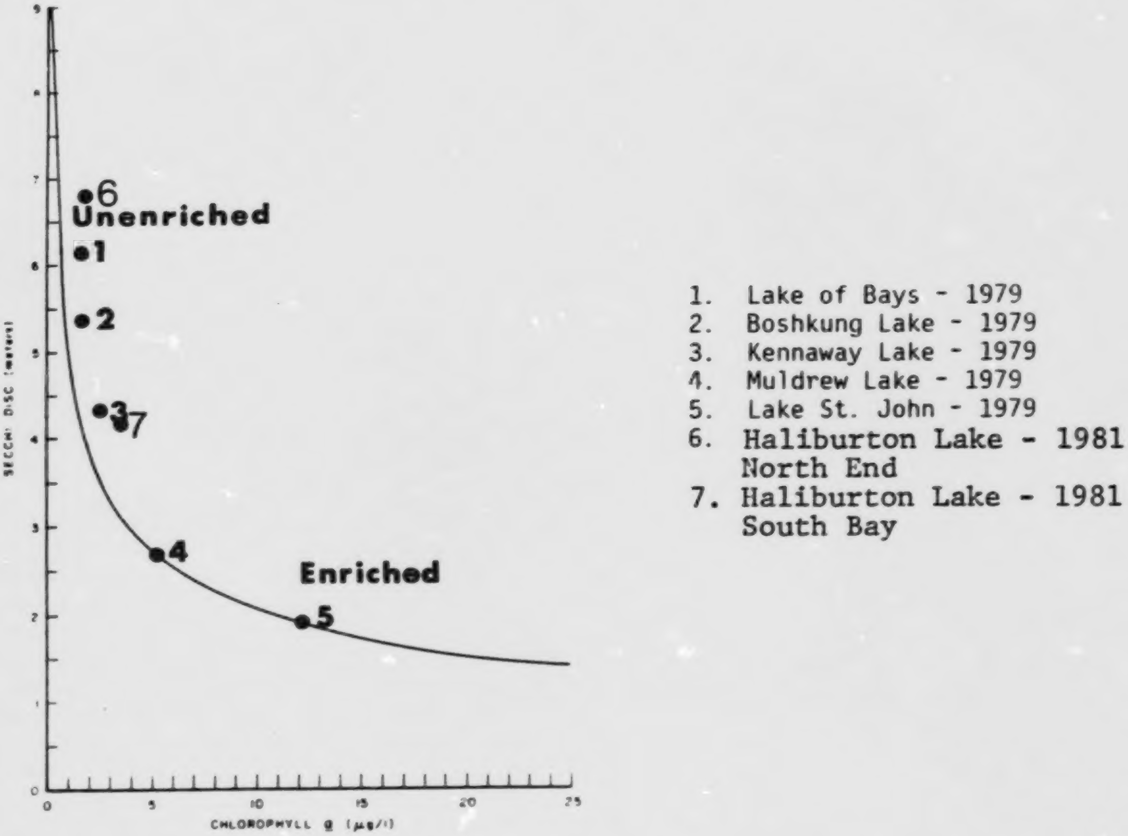
The Secchi disc readings ranged from 4.0 to 8.5 m at the north end of the lake and the degree of water transparency was lower in the south bay with readings ranging from 3.5 to 4.75 m. Chlorophyll a concentrations ranged from 0.9 to 2.3 ug/L at the north end and from 1.9 to 5.6 ug/L in the South Bay. Higher densities of suspended algae were present in the South Bay. Based on the seasonal means, the north end of Haliburton Lake would be considered unenriched while the South Bay would be considered moderately enriched. The difference in enrichment status of South Bay is probably due to nutrient imputs orginating from the Gull River which would affect the South Bay but not the north end of Haliburton Lake. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for next years program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Haliburton Lake from 1972 to 1981.

Station	Main - North End		South Bay	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972	6.3*	1.0*	3.5*	2.7*
1973	6.0	1.8	- -	- -
1974	6.7	1.1	3.8	2.4
1975	6.4	2.5	3.6	3.3
1976	6.0	1.7	4.0	4.7
1977	7.6(6.4*)	- -(1.8*)	4.3(3.6*)	- -(2.9*)
1978	7.3	1.9	4.2	3.2
1979	6.5	3.4	4.1	5.3
1980	6.5**	2.9**	3.4	5.9
1981	6.8	1.6	4.6	3.6

* MOE data
** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Haliburton Lake and a number of recreational lakes in the province. All data are seasonal means.



In 1981, an excellent sampling program was conducted on Haliburton Lake. The results of this program indicate that the water quality condition of Haliburton Lake is relatively stable. The South Bay had a slightly higher degree of water transparency and lower densities of suspended algae than in previous years. We hope that participation in this program continues in order to monitor long-term water quality trends.

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Harp Lake

Chaffey Ward

Town of Huntsville

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Harp Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
July 19	4.6	DM
Aug. 5	4.2	2.8
9	4.2	3.8
23	5.0	2.0
Mean	4.5	2.9

D.M. - data missing

The Secchi disc readings ranged from 4.2 to 5.0 m and chlorophyll a concentrations ranged from 2.0 to 3.8 ug/L. We recommend that the sampling frequency be increased, if possible, in order to get reliable seasonal means. Based on the seasonal means available, Harp Lake would be considered moderately enriched, characterized by a moderate degree of water transparency and moderate densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 season.

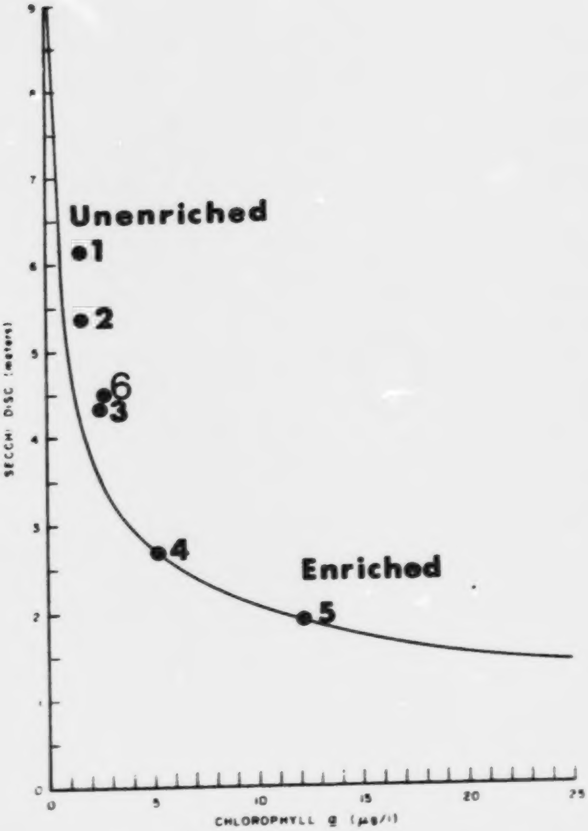
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Harp Lake from 1973 to 1981.

Station	Main		Deep Basin	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973	4.0	3.7	4.4*	2.8*
1974	3.7	2.1	3.7*	2.1*
1975	5.0	3.3	4.9*	3.3*
1976	4.5**	2.5**		
1977	4.8	- -		
1978	4.5	1.9		
1979	4.6**	2.8**		
1980	4.1	3.1		
1981	4.5**	2.9**		

* MOE data

** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for **Harp Lake** and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Harp Lake - 1981

Harp Lake has been sampled as part of the Self-Help Program since 1973. The water quality in Harp Lake has remained relatively constant since that time, showing no apparent trends toward a degradation in water quality. We hope that participation in this program continues.

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Head Lake

Laxton & Digby Townships

Victoria County

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Head Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
May 18	3.5	2.0
24	3.0	1.6
June 1	3.0	1.8
7	2.5	1.4
14	- -	2.2
21	3.75	2.7
28	2.75	1.3
July 5	2.5	2.3
12	3.0	2.8
19	2.5	2.5
27	2.75	DM
Aug. 3	2.5	DM
9	2.75	3.8
16	2.75	4.1
23	3.0	2.1
31	2.5	3.8
Sept. 7	2.75	3.1
Mean	2.8	2.5

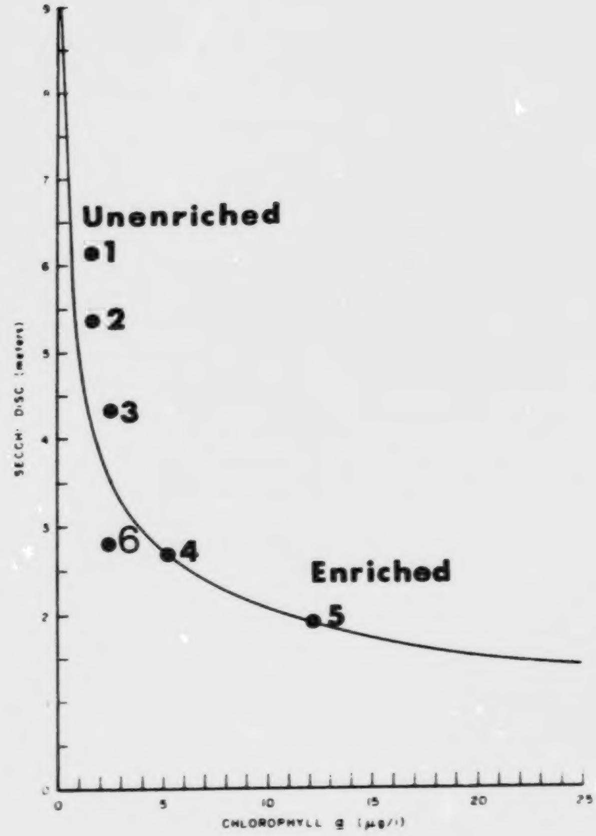
D.M. - data missing

An excellent sampling program was carried out on the lake during 1981. Based on the values shown in Table 1 Head Lake is considered moderately enriched with moderate algal densities and a moderate degree of water transparency.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Head Lake from 1972 to 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972	3.2	2.8
1973	2.9	3.0
1974	2.8	2.0
1975	2.8	2.7
1976	3.0	2.9
1977	3.3	- -
1978	2.9	2.5
1979	3.2	2.5
1980	3.3	2.7
1981	2.8	2.5

Figure 1: The relationship between Secchi disc and chlorophyll a for Head Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Head Lake - 1981

The lake enrichment status has remained relatively constant over the 10 years of record. Continued participation is encouraged.

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Kashagawigamog Lake

Dysart & Minden Townships

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Kashagawigamog Lake in 1981.

Station Date	South S.D.	Chl.a
June 21	4.0	4.8
28	4.0	4.2
July 5	3.8	4.0
7	3.7	2.0
10	3.8	4.8
19	3.8	3.3
Aug. 3	3.8	DM
30	3.7	1.7
Mean	3.8	3.5

D.M. - data missing

Secchi disc readings ranged from 3.7 to 4.0 m and chlorophyll a concentrations ranged from 1.7 to 4.8 ug/L during the sampling period. Densities of suspended algae exhibited greater variation than the degree of water transparency. Based on the seasonal means, Kashagawigamog Lake would be considered moderately enriched characterized by a moderate degree of water transparency and moderately high densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

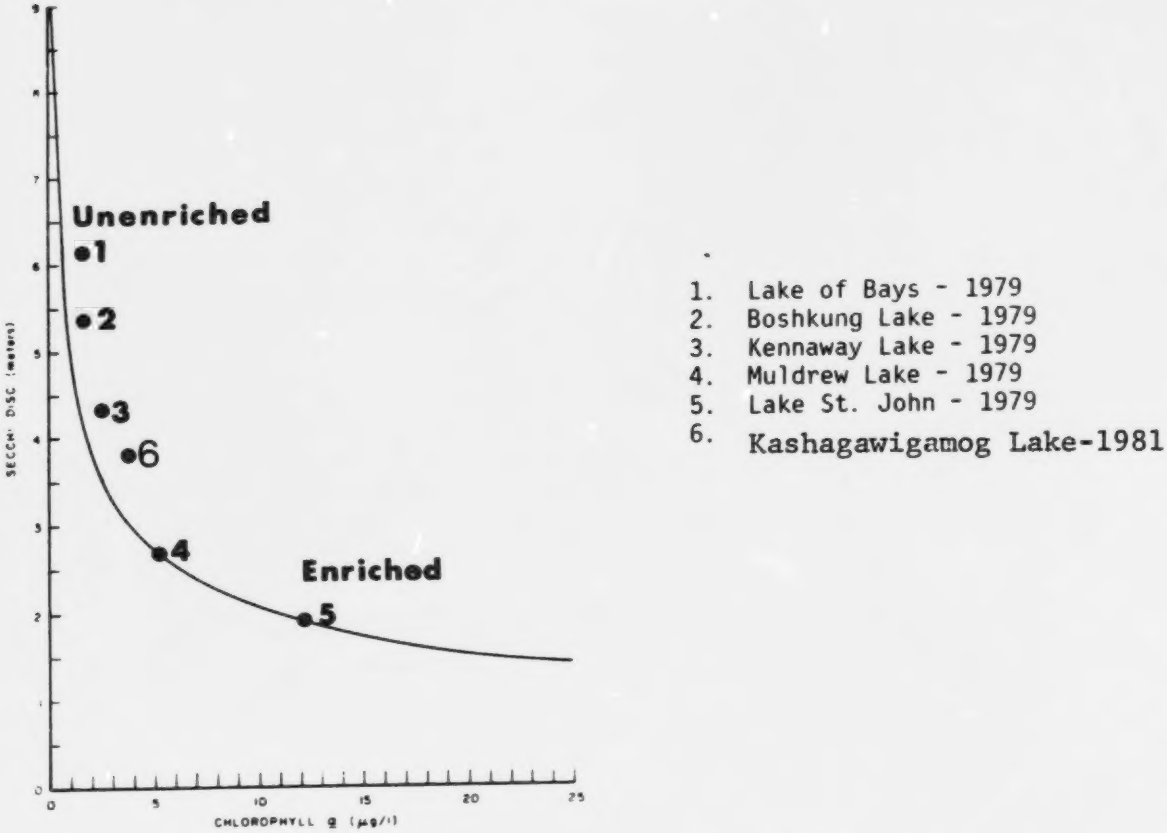
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Kashagawigamog Lake from 1972 to 1981.

Station Year	South S.D.	Chl.a	North S.D.	Chl.2
1971				
1972	- -	- -	4.2 *	4.7 *
1973	4.5	1.7	4.6	2.0
1974	4.6	1.5	4.4	1.4
1975	5.2**	1.1**	4.9	1.7
1976	4.5**(5.4*)	1.3**(2.1*)	4.0(4.7*)	2.7(2.8*)
1977	5.6	- -	4.9	- -
1978	5.4	1.6	4.1	1.8
1979	4.9	2.3	- -	- -
1980	4.6	3.2	- -	- -
1981	3.8	3.5	- -	- -

* MOE data

** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Kashagawigamog Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Kashagawigamog Lake-1981

In 1981, an excellent sampling program was conducted on Kashagawigamog Lake. The results of this program indicate that the degree of water transparency was lower and densities of suspended algae were higher than in previous years. The reason for this is not apparent however, in the past (1974) Kashagawigamog Lake has experienced periods of high algal densities. We hope that participation in this program continues in order to determine whether this represents a long-term water quality range or a temporary condition.

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Kasshabog Lake

Belmont & Methune Townships

Peterborough County

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Kasshabog Lake in 1981.

Station	K9-Middle Lake	
Date	S.D.	Chl.a
May 18	4.0	1.2
June 1	5.0	3.8
14	4.1	2.6
24	4.3	2.1
July 5	5.1	3.6
12	4.1	2.4
26	4.5	DM
Aug. 4	5.1	2.4
16	3.2	1.7
Mean	4.4	2.5

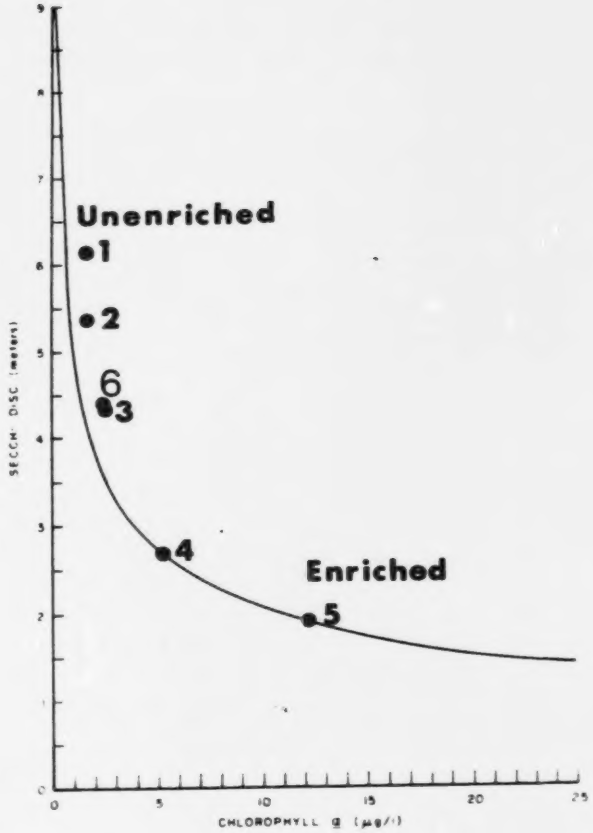
Based on the mean values of the two parameters shown in Table 1, the lake is considered moderately enriched with moderate algal densities and a moderately high degree of water transparency.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Kasshabog Lake in 1978 to 1981.

Station	Middle	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977		
*1978	4.0	1.7
1979	- -	- -
1980	4.9	1.8
1981	4.4	2.5

* MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Kasshabog Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Kasshabog Lake - 1981

No clear trends in enrichment status are evident in the yearly mean results shown in Table 2. Continued participation in the sampling program is encouraged to define long term trends.

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Kawagama Lake

Sherborne, Havelock, Livingstone & McClintock Townships

Provisional County of Haliburton.

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Kawagama Lake in 1981.

Station	1		2		3		4		5		6		7	
DATE	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
July 18	- -	- -	7.5	1.2	10.3	1.3	10.3	1.4	- -	0.8	8.2	1.8	- -	1.2
26	5.5	1.3	- -	- -	9.5	0.9	9.5	0.8	- -	- -	- -	- -	9.1	1.0
Aug. 3	5.6	DM	7.8	1.7	9.1	1.1	9.5	1.1	- -	- -	- -	- -	9.1	1.1
9	6.1	6.1	7.3	1.4	10.7	0.7	8.0	1.1	10.0	0.9	7.5	1.2	10.1	0.7
16	4.8	2.0	- -	- -	- -	- -	- -	- -	10.0	0.6	7.5	0.8	- -	- -
23	5.2	2.6	7.5	1.6	9.7	0.9	- -	- -	8.2	1.3	7.5	1.3	8.8	1.0
Sept 20	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	4.5	1.9	- -	- -
27	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	5.0	1.8	- -	- -
Oct. 12	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	6.0	1.7	- -	- -
Nov. 1	DM	1.8	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Mean	5.4	2.8	7.5	1.5	9.9	1.0	9.3	1.1	9.4	0.9	6.6	1.5	9.3	1.0

DM - data missing

The highest degree of water transparency was observed at stations 3,4,5,& 7 while the lowest degree of water transparency and the highest densities of suspended algae were observed at station 1 in Minden Bay. This is probably due to the shallow and isolated nature of this bay. Based on the information available, Kawagama Lake would be considered extremely unenriched with a high degree of water transparency and low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

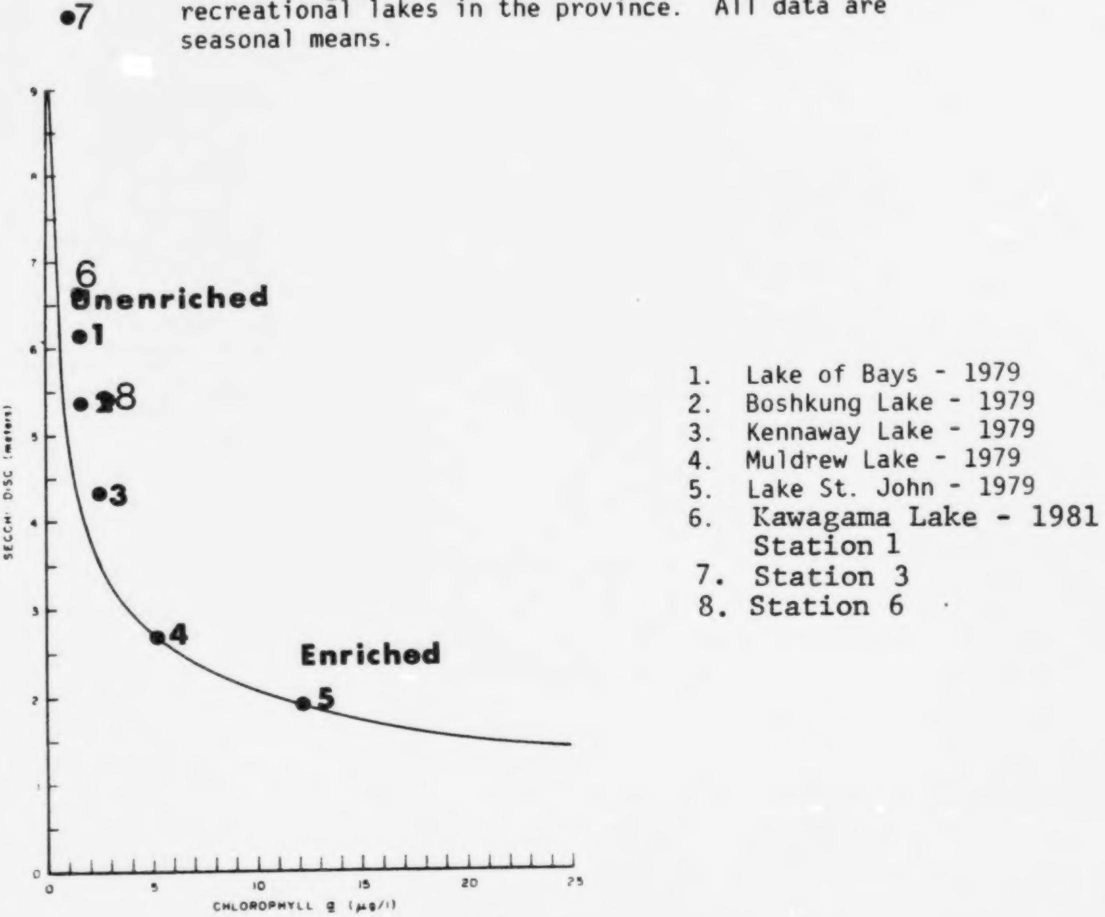
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Kawagama Lake from 1976 to 1981.

Station	1		2		3		4		5		6		7	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1971														
1972														
1973														
1974														
1975														
1976	4.5	2.5	7.2	1.6	9.6	1.0	10.1	1.0	9.5	1.1	7.1	1.4	9.5	1.3
1977	5.2	- -	7.8*	- -	8.6*	- -	9.4*	- -	10.8	- -	7.1*	- -	10.2*	- -
1978	5.5	2.9	7.9*	1.6*	8.0*	0.7*	10.4*	0.7*	7.1	1.0	7.2*	1.4*	8.8*	1.4*
1979	5.0*	3.4*	7.7*	2.5*	9.3*	0.8*	8.3	1.2	8.4	1.5	6.2*	2.0*	9.6*	1.1*
1980	5.1*	2.3*	7.0*	2.1*	9.2	1.0	9.3*	0.7*	8.2*	0.7*	6.0*	2.3*	7.3	1.3
1981	5.4*	2.8*	7.5*	1.5*	9.9*	1.0*	9.3*	1.1*	9.4*	0.9*	6.6	1.5	9.3*	1.0*

* Based on less than 6 samples

1976 MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Kawagama Lake and a number of recreational lakes in the province. All data are seasonal means.



Kawagama Lake has been sampled as part of the Self-Help Program since 1976. Unfortunately, at many stations a reliable seasonal mean could not be determined as fewer than 6 samples were taken during the ice-free period. We would like to suggest that perhaps fewer stations and increased sampling frequency on the remaining stations would provide much more meaningful results. Fewer stations would also facilitate the processing and tabulation of the results. For other large lakes such as Lake Muskoka, we are recommending a maximum of 6 stations per lake. Based on the long-term information available, Kawagama Lake has not undergone any significant change in water quality since 1976.

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Kennisis Lake

Havelock & Guilford Townships

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Kennisis Lake in 1981.

Station	A		B		C	
Date	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
July 5	7.0	0.3	7.0	0.3	6.0	0.5
12	6.5	DM	7.5	DM	- -	- -
Aug. 9	7.0	1.4	7.5	0.8	6.5	1.2
23	8.5	0.8	10.5	0.6	10.0	1.3
Mean	7.3	0.8	8.1	0.6	7.5	1.0

D.M. - data missing

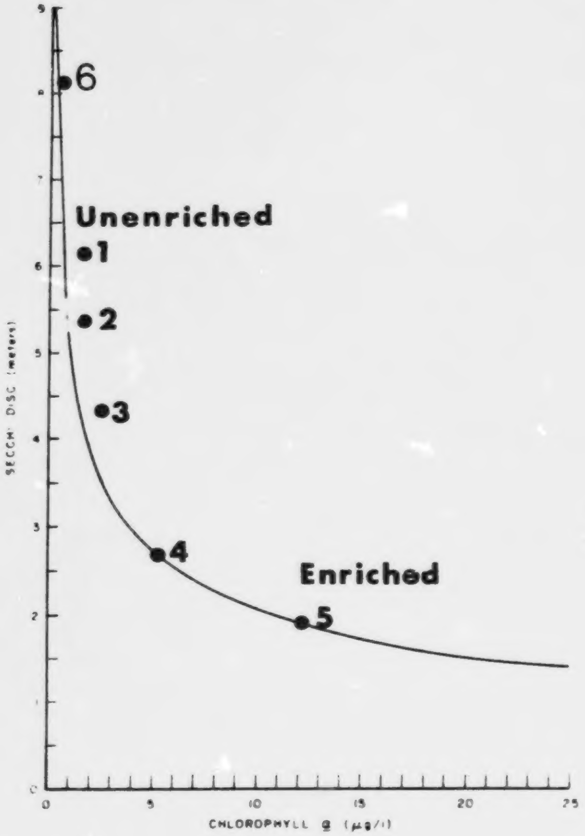
The highest degree of water transparency at all three stations was observed on August 23. The average chlorophylla concentrations were low at all stations. Based on the information available. Kennisis Lake would be considered extremely unenriched. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Kennisis Lake from 1972 to 1981.

Station	A		B		C	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	chl.a
1971						
1972	6.7	1.0	9.0	0.9	8.8	0.9
1973	7.8	0.7	9.5	0.8	9.5	0.8
1974	7.7	0.8	8.6	0.5	- -	- -
1975	9,6	1.0	10.0	0.6	10.5	0.8
1976	8.2	1.4	9.3	1.4	9.6	1.2
1977	9.4(9.2**)	- -(0.9**)	9.5	- -	9.6	- -
1978	9.3	1.0	9.8	1.0	9.6	1.0
1979	- -	- -	- -	- -	- -	- -
1980	7.5	0.8	8.2	0.8	7.4	0.9
1981	7.3*	0.8*	8.1*	0.6*	7.5*	1.0*

* based on less than 6 samples
** MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Kennisis Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Kennisis Lake - 1981
   Station B

Insufficient data was collected in the 1981 program to obtain reliable seasonal means. According to the information obtained there would appear to be no significant change in the water quality of Kennisis Lake since the initiation of the program in 1972. We hope that participation in this program continues in order to maintain the excellent historical record for Kennisis Lake.

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Lake Joseph

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Lake Joseph in 1981.

Station	J5		J6		J7		J8 Little	
	East Basin		Gordon Bay		North Basin		Lake Joseph	
Date	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
June 27	6.5	0.9	4.5	0.6	7.5	0.6	5.5	1.4
July 6	6.5	0.8	6.5	0.7	6.0	0.9	4.0	1.6
22	8.0	0.9	5.0	1.0	5.5	0.7	4.5	1.7
Aug. 6	8.0	1.7	8.0	0.9	8.0	0.7	5.0	2.3
17	- -	- -	- -	- -	- -	- -	- -	- -
21	5.0	1.8	3.0	6.2	4.0	5.7	3.0	3.0
23	- -	- -	- -	- -	- -	- -	- -	- -
30	8.0	3.0	8.0	1.5	8.0	1.2	6.5	1.7
Sept. 8	5.0	1.6	5.5	1.2	7.5	1.4	6.0	1.1
10	- -	- -	- -	- -	- -	- -	- -	- -
23	- -	- -	- -	- -	- -	- -	- -	- -
Mean	6.7	1.5	5.8	1.7	6.6	1.6	4.9	1.8

Average Secchi disc readings ranged from 4.9 m. at Little Lake Joseph to 7.6 m at Yoho Island, average chlorophyll a concentrations ranged from 1.4 ug/L at Yoho Island to 1.8 ug/L at Little Lake Joseph and South Basin. Based on seasonal means, Lake Joseph would be considered unenriched, characterized by a high degree of water transparency and low densities of suspended algae. The station numbers were altered somewhat so that they would correspond with stations previously sampled on Lake Joseph by MOE.

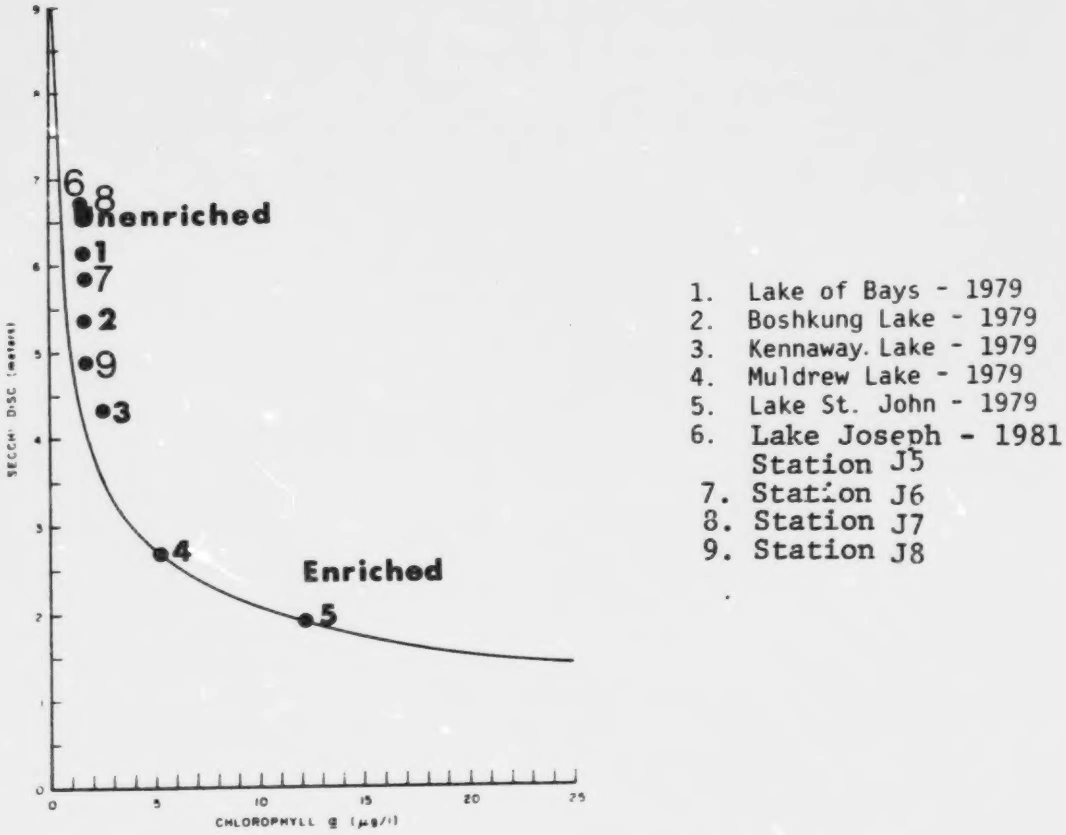
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Lake Joseph from 1969 to 1981.

Station	J5		J6		J7		J8 Little	
	East Basin		Gordon Bay		North Basin		Lake Joseph	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1969					8.1		5.8	
1970					8.2 **	1.1 **	5.8**	2.5**
1971								
1972								
1973								
1974					7.0	0.5		
1975					- -	- -		
1976					8.2	1.4	6.2	2.2
1977					8.3	- -	6.2	- -
1978					- -	- -	- -	- -
1979					- -	- -	- -	- -
1980					- -	- -	- -	- -
1981	6.7	1.5	5.8	1.7	6.6	1.6	4.9	1.8

* based on less than 6 samples

** MOE data - chlorophyll a concentrations are 2 year averages

Figure 1: The relationship between Secchi disc and chlorophyll a for Lake Joseph and a number of recreational lakes in the province. All data are seasonal means.



We recommend that participation in this program continue so that we can obtain a long-term record of water quality trends. We have some historical information for Stations J1, J2, J7 and J8. The results indicate that the enrichment status at stations J1 and J2 has not changed significantly since 1977, although there has been a slight decrease in the degree of water transparency. At stations J7 and J8 there has been no significant change in enrichment status but, again, the degree of water transparency has decreased somewhat. A complete water quality survey of Lake Joseph is planned for 1982

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Lake Joseph

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Lake Joseph in 1981.

Station	J1 Yoho Is.A		J2 Yoho Is. B.		J3 Cox Bay		J4 South Basin	
Date	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
June 27	- -	- -	- -	- -	7.0	1.5	7.0	0.8
July 6	- -	- -	- -	- -	8.5	0.9	9.5	0.8
22	- -	- -	- -	- -	6.0	1.4	6.2	1.0
Aug. 6	9.0	- -	8.5	- -	6.0	1.5	7.0	0.8
17	8.0	- -	8.0	- -	- -	- -	- -	- -
21	- -	- -	- -	- -	4.0	1.9	5.5	6.3
23	7.0	1.0	7.0	0.9	- -	- -	- -	- -
30	- -	- -	- -	- -	6.5	1.5	7.0	1.4
Sept. 8	- -	- -	- -	- -	5.0	1.6	6.0	1.3
10	6.0	1.6	6.0	1.7	- -	- -	- -	- -
23	8.0	1.6	8.0	1.5	- -	- -	- -	- -
Mean	7.6	1.4	7.5	1.4	6.1	1.5	6.9	1.8

SEE NEXT PAGE FOR TEXT

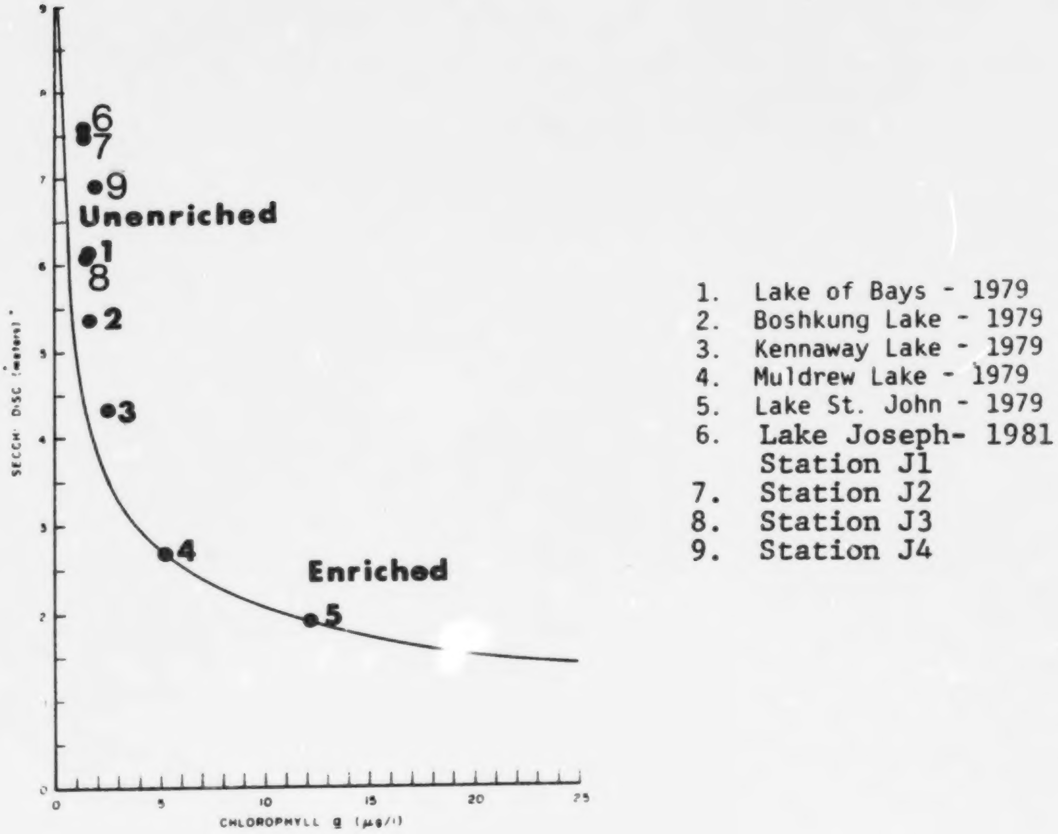
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Lake Joseph From 1970 to 1981.

Station	J1 Yoho Is. A		J2 Yoho Is. B		J3 Cox Bay		J4 South Basin	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1971								
1972								
1973								
1974								
1975								
1976								
1977	8.4	- -	8.6	- -	- -	- -	- -	--
1978	8.4	1.1	8.5	1.1	- -	- -	- -	- -
1979	8.5	3.6	9.3	2.6	- -	- -	- -	- -
1980	7.6	- -	7.6	- -	- -	- -	- -	- -
1981	7.6*	1.4*	7.5*	1.4*	6.1	1.5	6.9	1.8

* based on less than 6 samples
** MOE - data

Cont.......

Figure 1: The relationship between Secchi disc and chlorophyll a for Lake Joseph and a number of recreational lakes in the province. All data are seasonal means.



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Lake of Bays

Township of Lake of Bays

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Lake of Bays in 1981.

Station	#2 Trading		#5 Bigwin		#6 Haystack		#7 Fairview		#10 Seagull		#12 Dwight	
Date	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
June 14,17	6.0	0.9	5.0	0.9	6.0	0.6	6.0	0.8	5.0	0.7	5.0	1.0
July 2	5.0	1.5	6.0	1.6	6.5	1.5	6.0	1.2	6.5	1.1	6.0	1.0
Mean	5.5	1.2	5.5	1.3	6.3	1.1	6.0	1.0	5.3	0.9	5.5	1.0

Insufficient sampling was done in 1981 to draw meaningful conclusions.

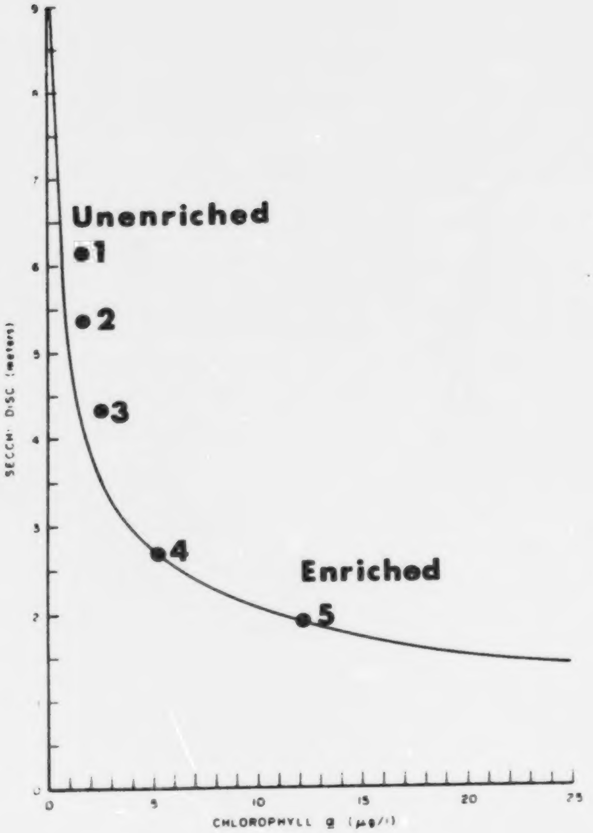
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Lake of Bays from 1977 to 1981.

Station	2		4		5		6		7		10		12	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1971														
1972														
1973														
1974														
1975														
1976														
1977	7.5	- -	6.5	- -	7.0	- -	6.3	- -	7.4	- -	6.1	- -	6.5	- -
1978	8.0*	1.3*	6.2	1.0	7.2	1.3	7.1	1.5	6.9	1.1	7.4	1.7	6.0	1.2
1978**	6.4	1.5	- -	- -	6.6	1.5	6.2	1.5	6.1	1.4	6.1	1.3	5.3	1.4
1979	6.2	1.7	7.5*	1.1*	6.6	1.6	6.3	2.0	6.4	1.3*	6.2	1.6	5.6	1.5
1980	7.2	1.4	- -	- -	7.2	1.4	7.0	1.4*	7.1	1.3	6.6	1.4	5.6	1.4
1981	5.5*	1.2*	- -	- -	5.5*	1.3*	6.3	1.1	6.0*	1.0*	5.3*	0.9*	5.5*	1.0*

* based on less than 6 samples.

** MOE survey

Figure 1: The relationship between Secchi disc and chlorophyll a for and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Not enough data available

We hope that sampling frequency increases in 1982. On this year's Self-Help program report, we have included the sampling results from an MOE survey which was conducted in 1978. The report was published in 1981 and the overall conclusions indicated that Lake of Bays has excellent water quality with some variations in the shallower bays.

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Lake Muskoka

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Lake Muskoka in 1981.

Station	1 North Basin		2 Tondern Is. (M3)		3 Bala Bay		4 Dudley Bay (M4)	
Date	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
July 5	5.5	0.7	5.5	0.8	7.5	0.8	6.5	0.7
19	3.5	2.1	3.75	2.0	7.5	0.8	5.0	1.0
Aug. 3	5.5	1.3	4.5	1.2	6.5	1.3	6.5	1.3
23	5.5	0.5	3.75	0.9	6.5	1.8	6.5	1.3
Sept.9	4.25	0.6	5.25	0.5	5.5	1.0	6.0	0.5
Oct.28	DM	DM	DM	DM	8.5	0.5	7.0	0.5
Mean	4.9	1.0	4.6	1.1	7.0	1.0	6.3	0.9

SB - sample, broken
DM - data missing

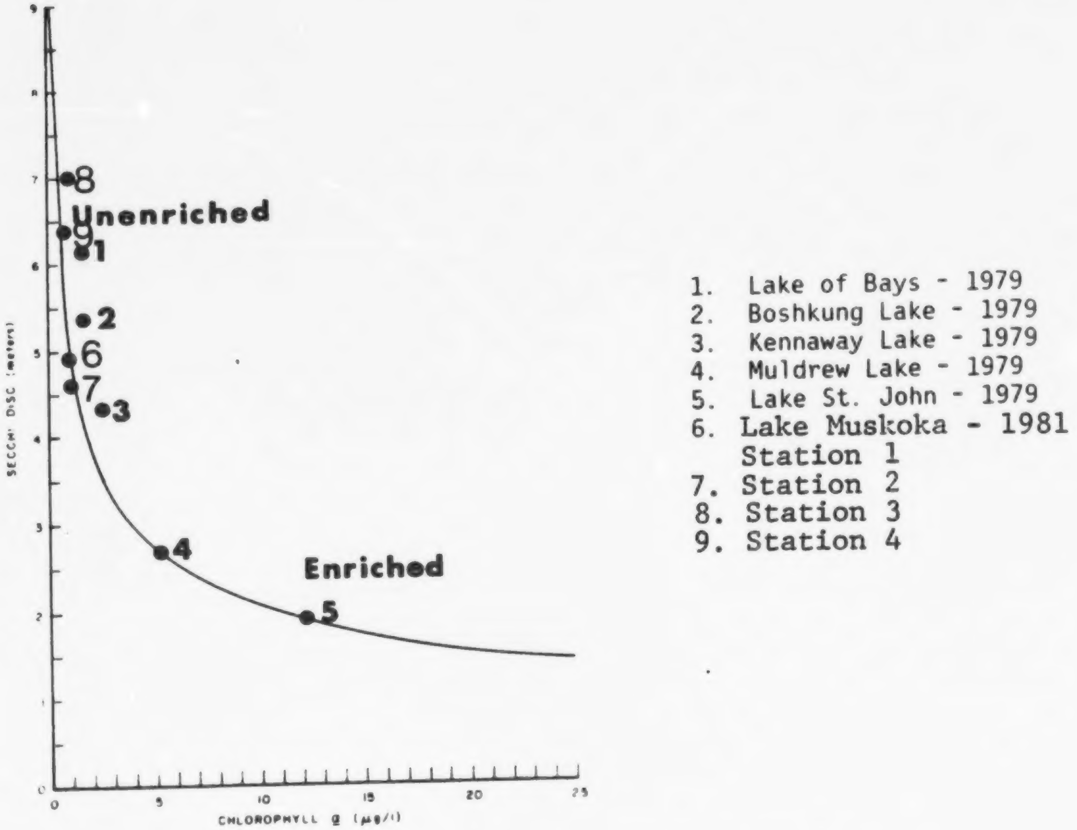
The average Secchi disc readings ranged from 3.2 m in the Muskoka River to 7.0 m in Bala Bay. The low degree of water transparency in The Muskoka River was probably due to suspended materials. The average chlorophyll a concentrations showed little variation ranging from 0.8 to 1.2 ug/L. Based on the seasonal means, all stations sampled would be considered unenriched.The highest degree of water transparency was observed at Bala Bay, Dudley Bay, North Bay and East Bay. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Lake Muskoka from 1969 to 1981.

Station	1		2		3		4	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1969			4.2*				4.9*	
1970			4.6*	1.88*			5.1*	1.49*
1971								
1972								
1973								
1974								
1975								
1976								
1977								
1978								
1979								
1980								
1981	4.9**	1.0**	4.6**	1.1**	7.0	1.0	6.3	0.9

* MOE data - chlorophyll a concentrations averaged for 2 years.
** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Lake Muskoka and a number of recreational lakes in the province. All data are seasonal means.



We recommend that participation in this program continue in order to obtain a long-term record of water quality trends. There is some historical information available for stations 2,4 and 8 (Table 2). The results of the 1969 - 1970 MOE survey indicate that, since then, chlorophyll a concentrations appear to have decreased, but, generally, there has been no significant change in the enrichment status of Lake Muskoka since 1969. A complete water quality survey of Lake Muskoka is planned for 1982.

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Lake Muskoka

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Lake Muskoka In 1981 .

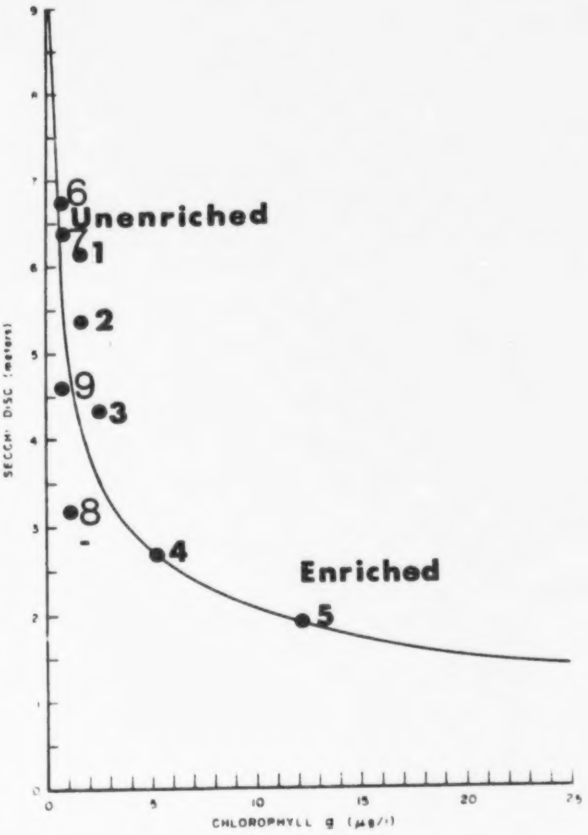
Station	5		6		7		8	
	North Bay		East Bay		Muskoka River		South Basin (M2)	
Date	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
July 5	7.0	0.7	7.5	0.8	3.5	1.1	6.0	0.6
19	7.5	0.8	6.5	0.9	2.75	1.8	3.5	1.4
Aug. 3	5.5	1.3	5.5	1.2	3.75	1.1	3.25	1.4
23	7.5	0.5	6.0	0.5	3.25	1.2	5.75	0.6
Sept.9	6.0	0.8	6.5	SB	2.75	0.8	4.5	0.7
Oct.28	DM	0.7	DM	0.6	DM	DM	DM	DM
Mean	6.7	0.8	6.4	0.8	3.2	1.2	4.6	0.9

SB - Sample, broken
DM - data missing

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Lake Muskoka from 1969 to 1981

Station	5		6		7		8	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1969							4.3*	
1970							4.5*	2.05*
1971								
1972								
1973								
1974								
1975								
1976								
1977								
1978								
1979								
1980								
1981	6.7 **	0.3	6.4 **	0.8 **	3.2 **	1.2 **	4.6 **	0.9 **

Figure 1: The relationship between Secchi disc and chlorophyll a for Lake Muskoka and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Lake Muskoka - 1981 Station 5
7. Station 6
8. Station 7
9. Station 8

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Lake Rosseau

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Lake Rosseau in 1981.

Station	1 Arthurlie Bay		2 Off Windermere		3 Skeleton Bay(R6)		4 Rosseau Head	
Date	S. D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
June 28	5.0	1.2	5.0	0.8	4.0	0.9	5.0	0.8
July 5	7.0	1.7	9.0	1.0	4.5	1.0	- -	- -
Aug. 3	6.0	0.3	6.0	0.5	5.0	0.4	5.0	0.6
23	5.0	1.9	- -	- -	- -	- -	- -	- -
Sept. 7	8.0	1.5	- -	- -	5.0	1.4	- -	- -
Oct. 12	6.0	0.3	- -	- -	4.0	0.3	- -	- -
Mean	6.2	1.2	6.7	0.8	4.5	0.8	5.0	0.7

The average Secchi disc readings ranged from 4.0 m in the North Basin to 9.0m off Gull Rock. The highest degree of water transparency was observed off Gull Rock. Average chlorophyll a concentrations ranged from 0.6 ug/L off Edith Island to 2.6 ug/L in Mirror Lake. Stations 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, and 13 were not sampled with sufficient frequency to obtain a reliable seasonal mean. We recommend that a maximum of 6 stations be sampled a minimum of 6 times. Based on the information available Lake Rosseau would be considered unenriched, characterized by a high degree of water transparency and low densities of suspended algae.

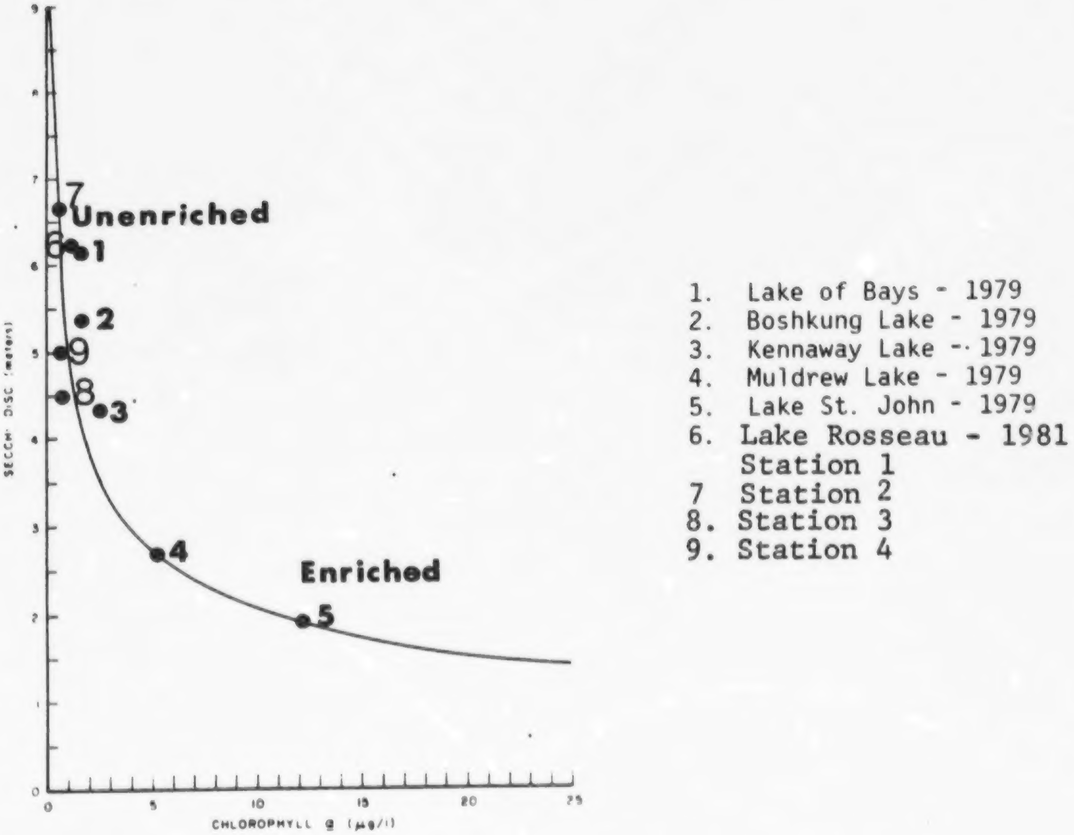
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Lake Rosseau From 1969 to 1981.

Station	1		2		3		4	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1969					5.0**			
1970					5.3**	1.5**		
1971								
1972								
1973								
1974								
1975								
1976								
1977					4.8	- -		
1978					6.2	1.5		
1979					- -	- -		
1980					- -	- -		
1981	6.2	1.2	6.7*	0.8*	4.5*	0.8*	5.0*	0.7*

* based on less than 6 samples

** MOE data - chlorophyll a concentrations are average of 2 years sampling

Figure 1: The relationship between Secchi disc and chlorophyll a for Lake Rosseau and a number of recreational lakes in the province. All data are seasonal means.



We recommend that participation in this program continue, in order to obtain a long-term record of water quality trends. We have some historical information available for Station 3 in Skeleton Bay and Station 9 in the West Basin. From this information, it appears that the enrichment status at these locations has not changed significantly since 1970 when an MOE survey was conducted. A complete water quality survey is planned for Lake Rosseau in 1982.

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Lake Rosseau

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Lake Rosseau in 1981.

Station Date	5 Lawrason Bay S.D.	Chl.a	6 Morgan Bay S.D.	Chl.a	7 Off Mazengah Is. S.D.	Chl.a	8 Off Edith Is. S.D.	Chl.a	9 West Basin (R5) S.D.	Chl.a
June 28	6.0	0.7	6.0	0.8	7.0	0.6	- -	- -	- -	- -
July 5	6.0	0.9	5.0	0.8	8.0	0.9	- -	- -	- -	- -
Aug. 3	- -	- -	6.0	0.6	- -	- -	6.0	0.8	- -	- -
23	- -	- -	4.0	1.1	- -	- -	- -	- -	5.0	0.9
Sept. 7	8.0	1.2	4.0	1.2	- -	- -	- -	- -	7.0	1.6
Oct. 12	4.0	0.4	5.0	0.5	- -	- -	6.0	0.3	- -	- -
Mean	6.0	0.8	5.0	0.8	7.5	0.8	6.0	0.6	6.0	1.2

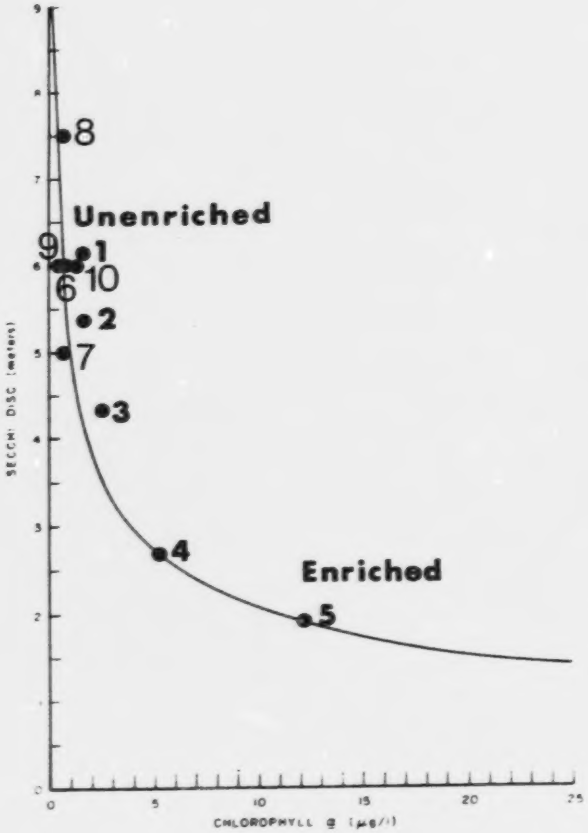
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Lake Rosseau from 1969 to 1981.

Station Year	5 S.D.	Chl.a	6 S.D.	Chl.a	7 S.D.	Chl.a	8 S.D.	Chl.a	9 S.D.	Chl.a
1969									6.0**	
1970									6.3**	1.7**
1971										
1972										
1973										
1974									6.4	0.7
1975										
1976									6.1	1.8
1977									4.8	- -
1978									6.2	1.5
1979									- -	- -
1980									- -	- -
1981	6.0*	0.8*	5.9	0.8	7.5*	0.8*	6.0*	0.6*	6.0*	1.2*

* based on less than 6 samples

** MOE data - chlorophyll a concentrations are average of 2 years sampling

Figure 1: The relationship between Secchi disc and chlorophyll a for Lake Rosseau and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Lake Rosseau - 1981
   Station 5
7. Station 6
8. Station 7
9. Station 8
10. Station 9

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Lake Rosseau

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Lake Rosseau in 1981.

Station	10 Mirror Lake		11 South Basin		12 North Basin		13 Off Gull Rock	
Date	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
June 28	- -	- -	- -	- -	- -	- -	- -	- -
July 5	- -	- -	- -	- -	- -	--	9.0	1.1
Aug. 3	- -	- -	- -	- -	- -	- -	- -	- -
23	4.0	3.5	- -	- -	- -	- -	- -	- -
Sept. 7	5.0	1.6	6.0	1.7	4.0	1.2	- -	- -
Oct. 12	- -	- -	10.0	0.4	- -	- -	- -	- -
Mean	4.5	2.6	8.0	1.0	4.0	1.2	9.0	1.1

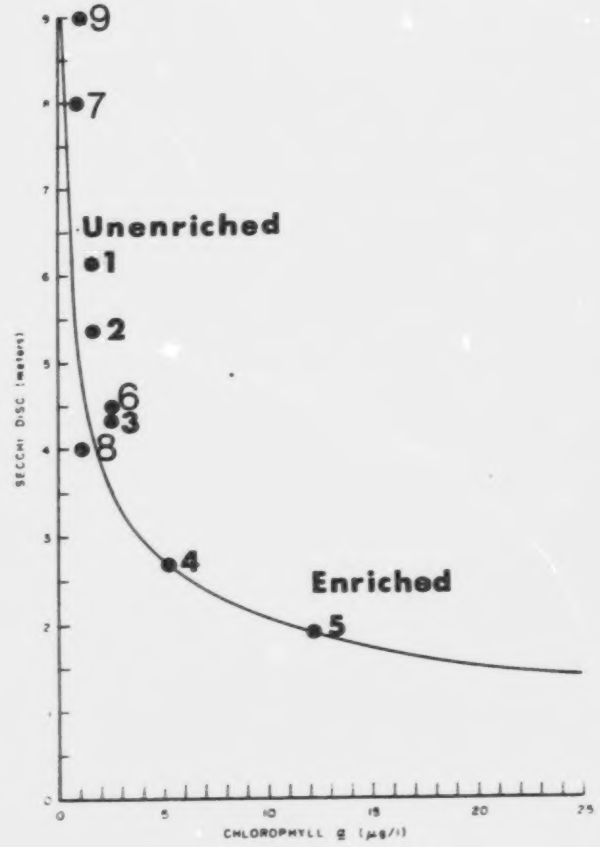
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Lake Rosseau in 1981.

Station	10		11		12		13	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1970								
1971								
1972								
1973								
1974								
1975								
1976								
1977								
1978								
1979								
1980								
1981	4.5*	2.6*	8.0*	1.0*	4.0*	1.2*	9.0*	1.1*

*based on less than 6 samples

** MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Lake Rosseau and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Lake Rosseau - 1981
   Station 10
7. Station 11
8. Station 12
9. Station 13

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Lake St. John

Rama Township

Simcoe County

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Lake St. John in 1981.

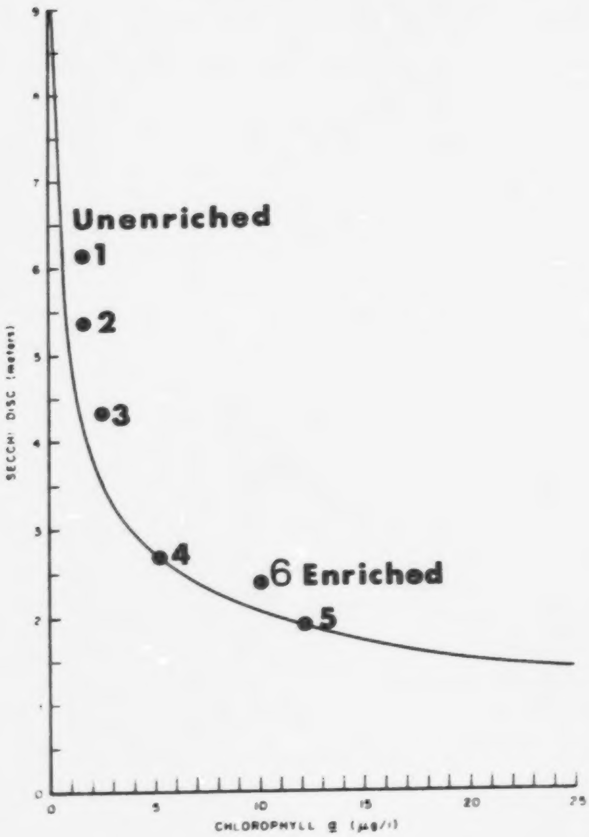
Station	Main	
Date	S. D.	Chl.a
June 14	3.33	18.0
27	4.0	1.3
July 12	3.75	4.4
26	2.3	7.1
Aug. 9	2.0	11.0
Aug. 29	2.0	1.5
Sept. 4	1.5	8.9
Sept. 7	1.5	23.0
20	1.5	15.0
Mean	2.4	10.0

A decreasing degree of water transparency is apparent over the sampling period. The algal density however does not directly correspond to this trend. Based on the mean values of the two parameters shown in Table 1 Lake St. John is considered enriched with high algal density and poor water transparency.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Lake St. John from 1979 to1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977		
1978		
1979	1.9	12.1
1980	2.0	20.4
1981	2.4	10.0

Figure 1: The relationship between Secchi disc and chlorophyll a for Lake St. John and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Lake St.John- 1981

No long term trend in enrichment status is apparent as yet. Continued participation in the sampling program is encouraged.

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Leech Lake

Oakley Ward

Town of Bracebridge

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Leech Lake in 1981.

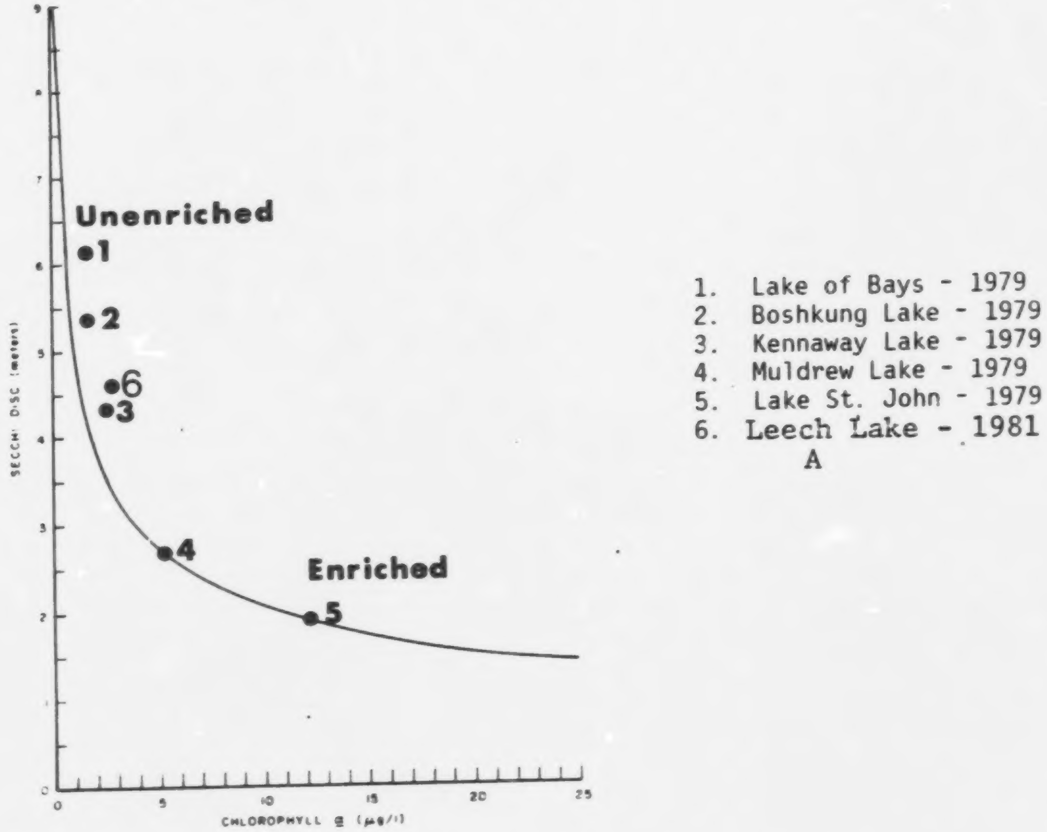
Station	A North Bay		B East Bay		C West Bay	
Date	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
May 31	2.75	3.8	3.0	4.6	3.0	4.3
June 14	3.5	4.0	3.5	4.3	3.5	4.0
July 5	3.75	3.9	4.0	3.5	4.0	5.6
19	5.75	2.7	5.25	4.2	5.25	1.6
Aug. 16	4.75	0.2	5.0	4.8	5.0	4.7
23	5.5	1.6	5.0	1.4	5.0	4.6
Sept. 7	5.5	3.8	5.0	3.4	5.5	4.2
13	5.0	3.2	5.5	2.6	5.5	2.5
20	5.25	3.4	5.25	2.8	5.25	2.4
Mean	4.6	3.0	4.6	3.5	4.7	3.8

The Secchi disc readings ranged from 2.75 to 5.75 m with the lowest degree of water transparency at all stations occurring from May 31 to July 5, 1981. The chlorophyll a concentrations ranged from 0.2 to 5.6 ug/L. Based on the seasonal means, all three stations would be considered moderately enriched characterized by a moderately high degree of water transparency and moderate densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Leech Lake from 1977 to 1981.

Station	A North Bay		B East Bay		C West Bay	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1971						
1972						
1973						
1974						
1975						
1976						
1977	5.4	- -	5.0	- -	5.4	- -
1978	3.8	4.5	4.1	4.4	4.0	5.1
1979	4.6	4.0	4.8	4.5	5.0	6.5
1980	4.2	4.0	4.0	4.2	4.6	5.8
1981	4.6	3.0	4.6	3.5	4.7	3.8

Figure 1: The relationship between Secchi disc and chlorophyll a for Leech Lake and a number of recreational lakes in the province. All data are seasonal means.



Once again, an excellent sampling program was conducted on Leech Lake in 1981. The results of this program indicate that the degree of water transparency did not change significantly from previous years but average chlorophyll a concentrations were slightly lower than levels observed since 1978. This is probably a temporary condition due to natural fluctuations in algal densities at various times of the year. The condition of Leech Lake appears to be stable, however, we hope that participation in this program continues in order to maintain the historical record.

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Leonard Lake

Monck Ward

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Leonard Lake in 1981.

Station	North Bay	
Date	S.D.	Chl.a
Aug. 5	3.0	2.4*
8	2.3	3.6*
17	3.0	1.1
23	4.5	1.0
30	4.6	1.2
Sept. 7	5.5	1.2
Mean	3.8	1.8

*Sample turned turbid - preservative may have been contaminated.

The Secchi disc readings ranged from 2.3 to 5.5 m and chlorophyll a concentrations ranged from 1.0 to 3.6 ug/L. The mean values obtained for the two parameters measured are not true seasonal means since no samples were taken during May, June or July. Based on the means available North Bay of Leonard Lake would be considered between unenriched and moderately enriched, characterized by a moderately high degree of water transparency and low densities of suspended algae.

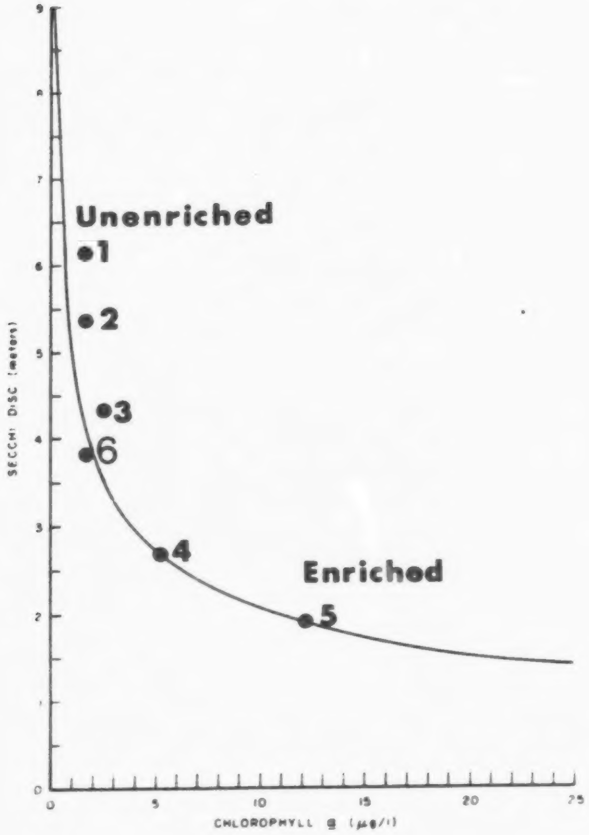
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Leonard Lake from 1971 to 1981.

Station	North Bay		Deep Basin	
Year	S.D.	Chl.a	S.D.	Chl.a
1971			5.3*	1.8*
1972				
1973				
1974				
1975	5.3**	1.5**		
1976	6.5**	1.7**		
1977	6.0	- -		
1978	- -	- -		
1979	4.4**	2.3**		
1980	4.4	2.8		
1981	3.8	1.8		

* MOE data

** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Leonard Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Leonard Lake - 1981

Leonard Lake has been sampled as part of the Self-Help Program since 1975. Based on the available data, the degree of water transparency has decreased slightly since 1971. The average chlorophyll a concentrations have not shown a corresponding increase. In general, the enrichment status of Leonard Lake has fluctuated between moderately enriched and unenriched since sampling began. The actual condition of the lake is relatively stable but dueto natural fluctuations in algal densities from year to year and the borderline nature of water quality in Leonard Lake, the enrichment status appears to change. We hope that participation in this program continues in order to maintain the historical record of enrichment status.

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Little Lake

Township of Georgian Bay

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Little Lake in 1981

Station	Main	
Date	S.D.	Chl.a
Aug.	3.25	2.1

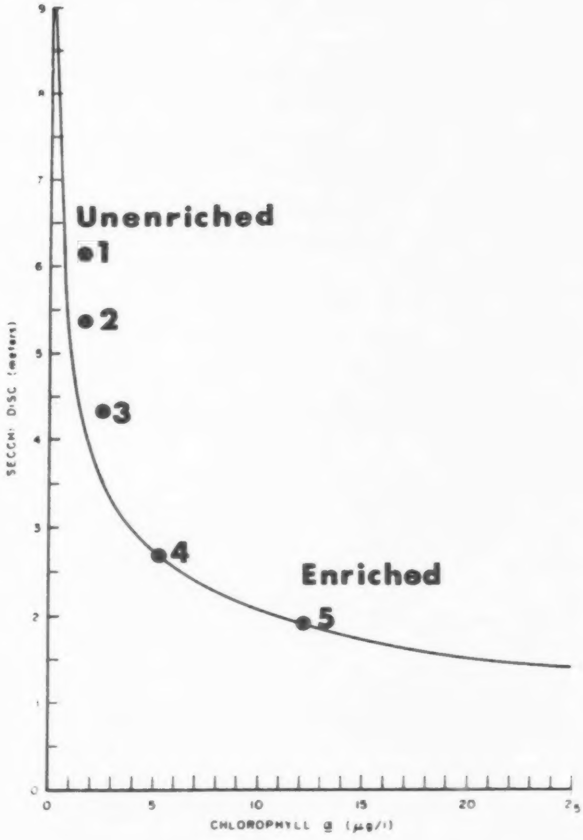
Insufficient data was collected for any meaningful conclusions to be made.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Little Lake in 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977		
1978		
1979		
1980	3.25*	4.3*
1981	3.25*	2.1*

* based on 1 sample

Figure 1: The relationship between Secchi disc and chlorophyll *a* for and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. insufficient data available

It is recommended that if this programme is to be continued, at least six samples should be taken throughout the season in order to get a reliable seasonal mean.

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Little Kennisis Lake

Havelock Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Little Kennisis Lake in 1981.

Station	M	
Date	S.D.	Chl.a
July 5	4.0	0.2
Aug. 9	5.0	2.5
23	5.5	1.4
Mean	4.8	1.4

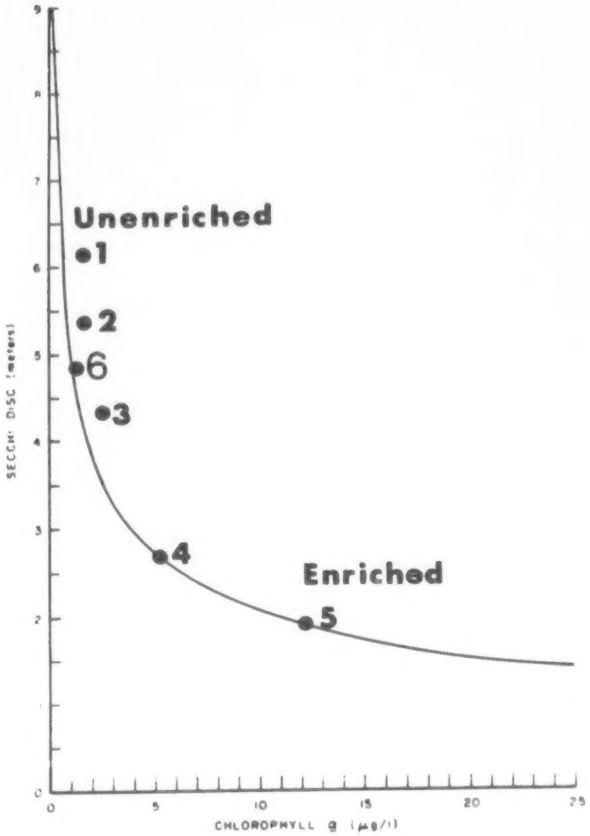
Insufficient data was collected on Little Kennisis Lake in 1981 to obtain a reliable seasonal mean. Based on the information available, Little Kennisis Lake appears to be unenriched, characterized by a moderately high degree of water transparency and low densities of suspended algal.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Little Kennisis Lake from 1972 to 1981.

Station	M	
Year	S.D.	Chl.a
1971		
1972	4.5*	1.6*
1973	4.8	1.1
1974	5.3	1.1
1975	5.5	1.0
1976	5.3*	2.0*
1977	6.3(6.3**)	- -(1.4**)
1978	5.5	1.4
1979	- -	- -
1980	4.2	1.7
1981	4.8*	1.4*

* based on less than 6 samples
** MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Little Kennisis Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Little Kennisis Lake - 1981

For the most part an excellent sampling program has been conducted on Little Kennisis Lake since 1972. Information obtained from this program indicates that the water quality of the lake is good and the condition of the lake has remained stable since the initiation of the program. We hope that participation in this program continues in order to maintain the excellent historical record for Little Kennisis Lake.

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Little Straggle Lake

Harcourt Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Little Straggle Lake in 1981.

Station Date	Main S.D.	 Chl.a
May 18	5.2	5.7
May 24	7.0	1.3
June 12	4.5	2.6
24	4.3	3.1
Aug. 9	5.4	2.4
23	5.5	1.9
Mean	5.3	2.8

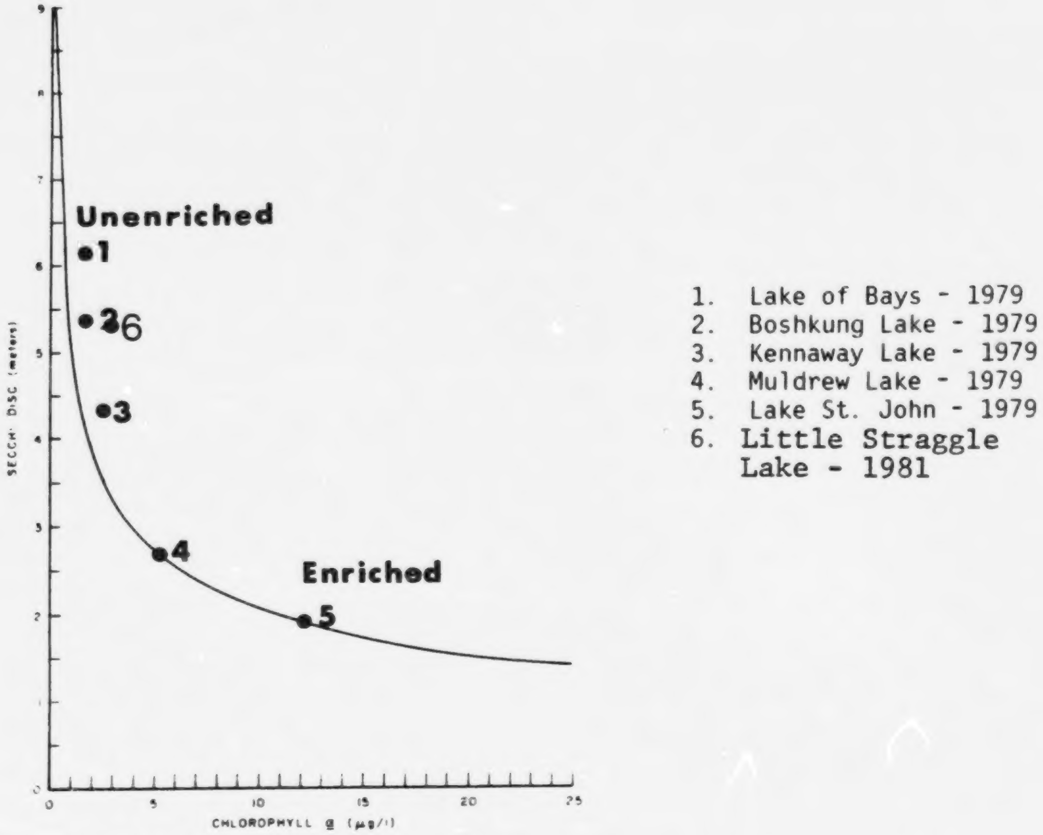
The Secchi disc readings ranged from 4.3 to 7.0 m and chlorophyll a concentrations ranged from 1.3 to 5.7 ug/L during the sampling period. Based on the seasonal means for the two parameters measured, Little Straggle Lake would be considered moderately enriched, characterized by a high degree of water transparency and moderately low densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Little Straggle Lake from 1973 to 1981.

Station Year	Main S.D.	 Chl. a	Deep Basin S.D.	 Chl.a
1971				
1972				
1973	3.8**	2.9**		
1974	3.6	1.6		
1975	5.3	2.4		
1976	4.1	2.2		
1977	5.3	- -	4.5*	2.3*
1978	4.6	2.4		
1979	4.3	4.0		
1980	4.9	3.9		
1981	5.3	2.8		

*MOE data
** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Little Straggle Lake and a number of recreational lakes in the province. All data are seasonal means.



Little Straggle Lake has been sampled as part of the Self-Help Program since 1973. The results of this program indicate that the enrichment status of the lake has remained relatively stable since 1973, with some natural yearly variation in both water transparency and suspended algae density. We hope that participation in this program continues in order to maintain the historical record on Little Straggle Lake.

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Ontario Ministry of the Environment, Central Region, 150 Ferrand Drive, DON MILLS, Ontario, M3C 3C3, Telephone: (416) 424-3000, Attention: Dhan Sharma

Long Lake

Dudley Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Long Lake in 1981.

Station	(1) West	
Date	S.D.	Chl.a
May 19	6.5	1.0
June 12	4.5	2.5
22	5.0	5.0
July 3	5.5	6.1
Aug. 3	5.0	DM
Mean	5.3	3.7

D.M. - data missing

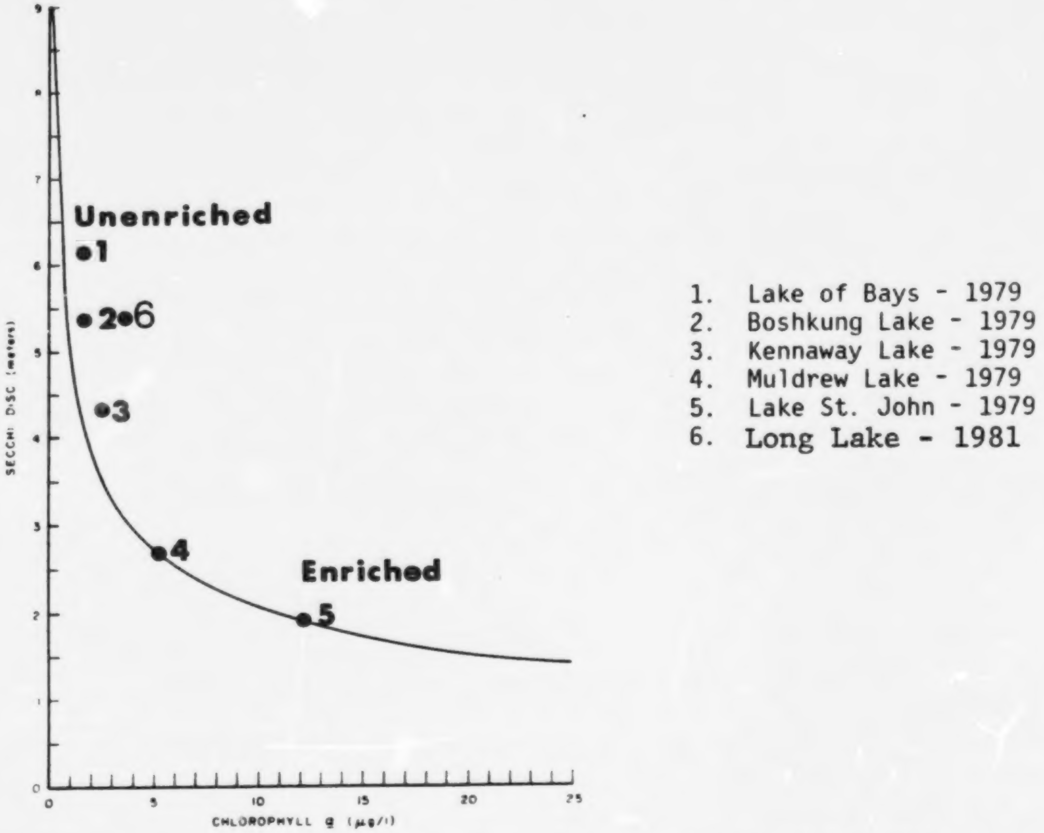
The Secchi disc readings ranged from 4.5 to 6.5 m and chlorophyll a concentrations ranged from 1.0 to 6.1 ug/L during the sampling period. Densities of suspended algae increased steadily to the end of the sampling period. Based on the means available, Long Lake would be considered moderately enriched, characterized by a high degree of water transparency and moderately high densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Long Lake from 1977 to 1981.

Station	1		2	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973				
1974				
1975				
1976				
1977	5.6	- -	6.1	- -
1978	6.3*	5.0*	5.7*	4.3*
1979	5.6	5.7	- -	- -
1980	4.9	6.6	- -	- -
1981	5.3	3.7	- -	- -

*based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Long Lake and a number of recreational lakes in the province. All data are seasonal means.



We now have 5 years of data for Long Lake. Since 1977, the degree of water transparency has fluctuated from year to year. Average chlorophyll a concentrations have also fluctuated, however there is no apparent trend evident. The fluctuations appear to be the result of periodic increases in densities of suspended algae. In 1981, there were no algae blooms, however, in 1980 high densities of algae were observed on May 18 and July 27. We hope that participation in this program continues in order to maintain a historical record of enrichment status of Long Lake.

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Long Lake

Wood Ward

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Long Lake in 1981.

Station		West End	
Date		S.D.	Chl.a
June	14	2.0*	1.9
	20	2.5*	2.2
	28	2.5*	1.6
July	5	2.5*	3.9
	12	2.5*	0.6
	19	2.5*	DM
	26	2.5*	1.6
Aug.	23	2.5*	1.8
	30	2.5*	1.2
Sept.	7	2.5*	0.5
Mean		G2.5	1.7

* Secchi disc on bottom
G- greater than
DM - data missing

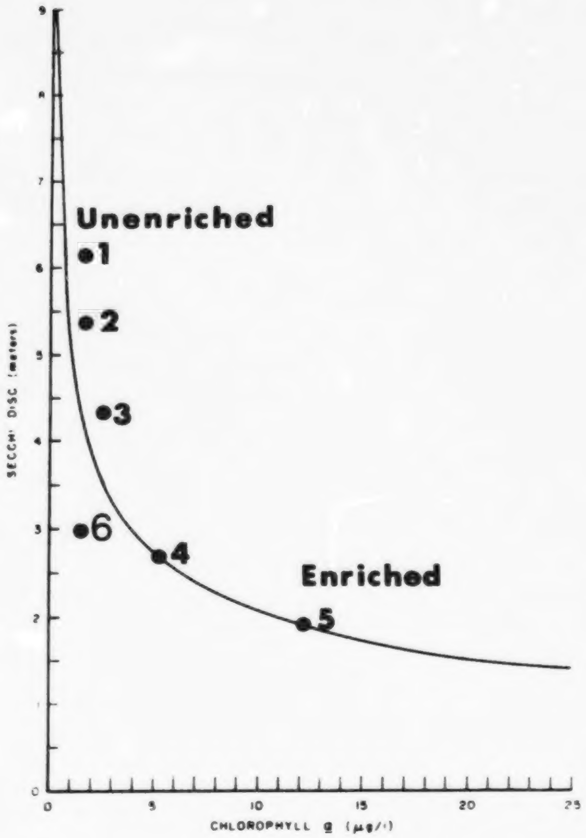
The Secchi disc was on bottom and still visible and chlorophylla concentrations ranged from 0.5 to 3.9 ug/L during the sampling period. Based on the average chlorophyll a concentration and 1977 MOE Secchi disc readings in mid-lake, Long Lake would be considered unenriched, characterized by a moderately high degree of water transparency and low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Long Lake in 1981.

Station	West End		Mid Lake	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973				
1974				
1975				
1976				
1977			4.7*	1.3*
1978				
1979				
1980				
1981	G2.5	1.7		

* MOE data
G-Greater than

Figure 1: The relationship between Secchi disc and chlorophyll a for Long Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Long Lake - 1981

An excellent sampling program was conducted on Long Lake in 1981. The results of that program as compared to a water quality survey done in 1977 by MOE indicate that Long Lake has good water quality. We hope that participation in this program continues so that we can monitor any long-term changes in enrichment status.

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Loon Lake

Dysart Township (Dudley & Monmouth Townships)
Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Loon Lake in 1981.

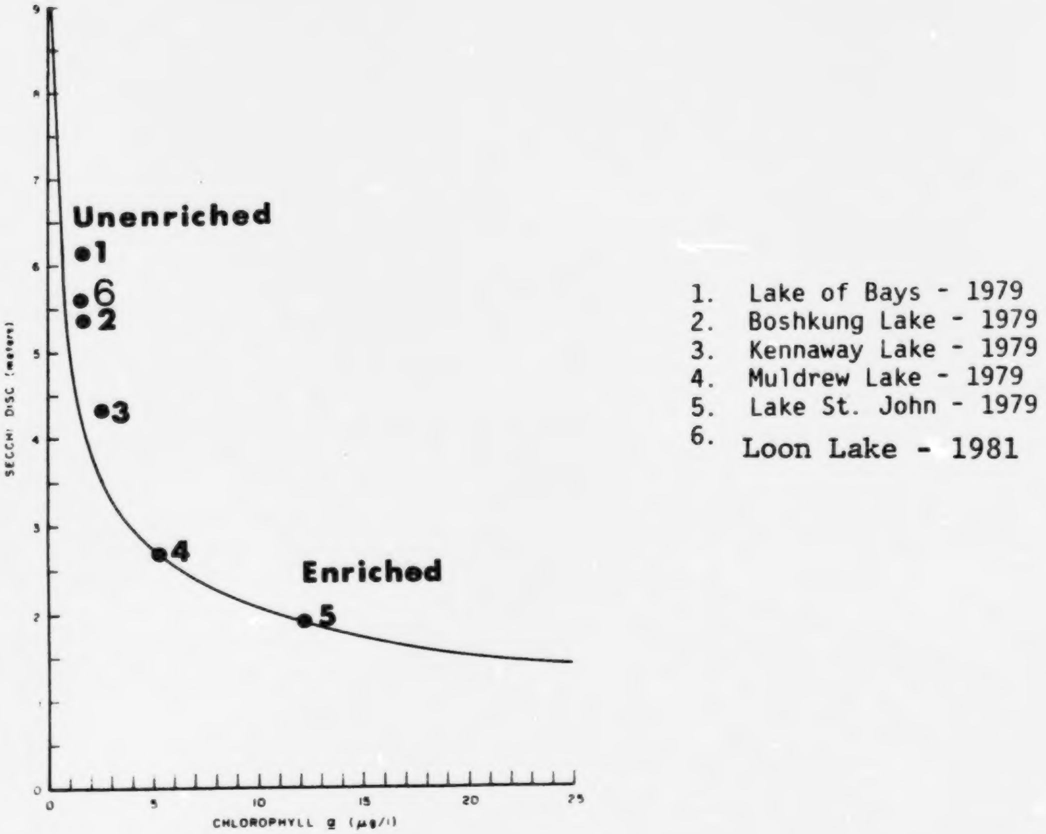
Station	Main	
Date	S.D.	Chl.a
May 29	7.8	0.5
June 12	6.3	2.0
July 19	3.8	2.7
Aug. 16	4.5	1.9
Aug. 30	5.8	1.1
Mean	5.6	1.6

The Secchi disc readings ranged from 3.8 to 7.8 m and chlorophyll a concentrations ranged from 0.5 to 2.7 ug/L during the sampling period. The highest degree of water transparency was observed on May 29 and corresponded to the lowest densities of suspended algae. Based on the means available Loon Lake would be considered unenriched, characterized by a high degree of water transparency and low densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Loon Lake from 1979 to 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977		
1978		
1979	4.8	1.8
1980	4.4	2.3
1981	5.6*	1.6*

Figure 1: The relationship between Secchi disc and chlorophyll a for Loon Lake and a number of recreational lakes in the province. All data are seasonal means.



Loon Lake has been sampled as part of the Self-Help Program since 1979. In the past three years the enrichment status has fluctuated between moderately enriched and unenriched depending on the densities of suspended algae present during the sampling period. We hope that participation in this program continues so that we can monitor any long-term changes in enrichment status.

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Mary Lake

Stephenson & Brunel Wards
Town of Huntsville

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Mary Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
Aug. 4	4.0	2.0
11	4.0	3.1
18	4.5	0.9
25	4.5	1.6
Mean	4.3	1.9

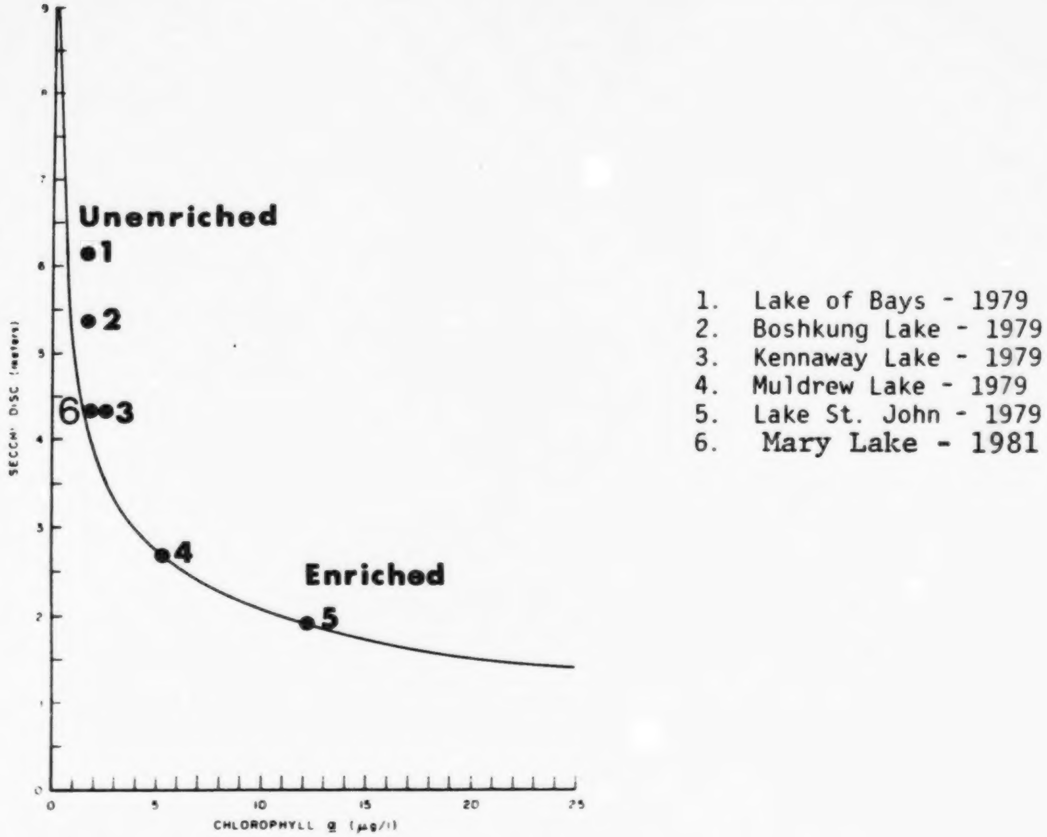
The Secchi disc readings ranged from 4.0 to 4.5 m and chlorophyll a concentrations ranged from 0.9 to 3.1 ug/L during the sampling period. Unfortunately, the means available are not true seasonal means since only 4 samples were taken in August Based on the means available, Mary Lake would be considered unenriched, characterized by a moderately high degree of water transparency and low densities of suspended algae. We feel that the water transparency would be higher except for the natural brown colour of the water in Mary Lake.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Mary Lake from 1974 to 1981.

Station	Main		Deep Basin	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973				
1974	4.5**	1.7**		
1975	3.8	1.7		
1976	4.1	2.3		
1977	4.3	- -		
1978	4.2	2.5**	3.1*	2.5*
1979	4.3**	1.6**		
1980	4.1	1.8		
1981	4.3 **	1.9**		

* MOE data
** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Mary Lake and a number of recreational lakes in the province. All data are seasonal means.



Based on the 8 years of available data on Mary Lake, the average Secchi disc readings and chlorophyll a concentrations have exhibited very little yearly variation. The enrichment status of Mary Lake has bordered between moderately enriched and unenriched since 1974. In previous years, Mary Lake has been classified as moderately enriched because the water transparency was less than 5 metres. The results of the 1978 MOE water quality survey indicate that Mary Lake is moderately coloured with natural humic substances and we feel that the degree of water transparency is affected most by this brown colour rather than suspended algae. Based on this we have changed the classification of Mary Lake to unenriched.

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Medora Lake

Medora Ward

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Medora Lake in 1981.

Station	1	
Date	S.D.	Chl.a
May 18	3.5	0.8
June 7	3.5	3.0
14	3.5	2.9
July12	3.25	3.9
Aug.12	4.0	7.2
Sept.6	3.5	2.8
Sept20	4.0	4.3
Oct.11	3.5	1.4
Mean	3.6	3.3

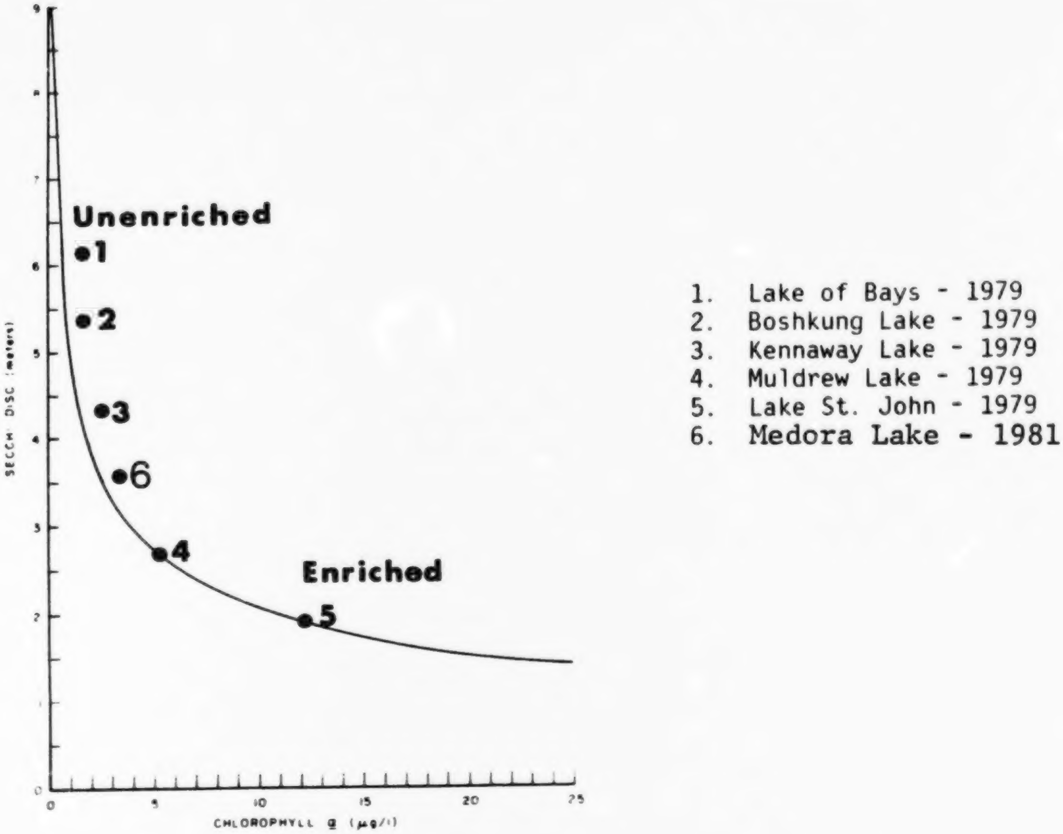
The Secchi disc readings ranged from 3.25 to 4.0 m and chlorophyll a concentrations ranged from 0.8 to 7.2 ug/L during the sampling period. Based on the seasonal means, Medora Lake would be considered moderately enriched, characterized by a moderate degree of water transparency and moderate densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Medora Lake 1974 to 1981.

Station	1	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974	3.7	2.0
1975	4.1	9.0
1976	- -	- -
1977	4.1*	- -
1978	3.6*	3.3*
1979	4.9*	7.1*
1980	6.0	8.6
1981	3.6	3.3

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Medora Lake and a number of recreational lakes in the province. All data are seasonal means.



In 1981, an excellent sampling program was conducted on Medora Lake. Since 1974, the average Secchi disc readings have ranged from 3.6 to 6.0 m and average chlorophyll a concentrations have ranged from 2.0 to 9.0 ug/L. There is a great deal of yearly variation in water transparency and densities of suspended algae in Medora Lake. This variation is typical of moderately enriched lakes due to the periodic increases in algal densities. We hope that participation in this program continues in order to monitor any long-term changes in enrichment status.

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Miskwabi Lake

Dudley Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Miskwabi Lake in 1981.

Station	6 (West)		13 (East)	
Date	S.D.	Chl.a	S.D.	Chl.a
May 18	6.0	2.1	- -	- -
24	- -	- -	5.75	1.1
31	- -	- -	5.25	2.0
June 28	- -	- -	5.5	1.9
July 5	- -	- -	6.75	1.1
July 12	6.5	1.2	5.5	1.5
26	- -	- -	6.25	DM
Aug. 3	6.5	DM	- -	- -
9	- -	- -	6.25	2.0
Aug. 23	7.0	1.2	6.5	1.7
Sept. 7	- -	- -	6.5	1.6
Mean	6.5	1.5	6.0	1.6

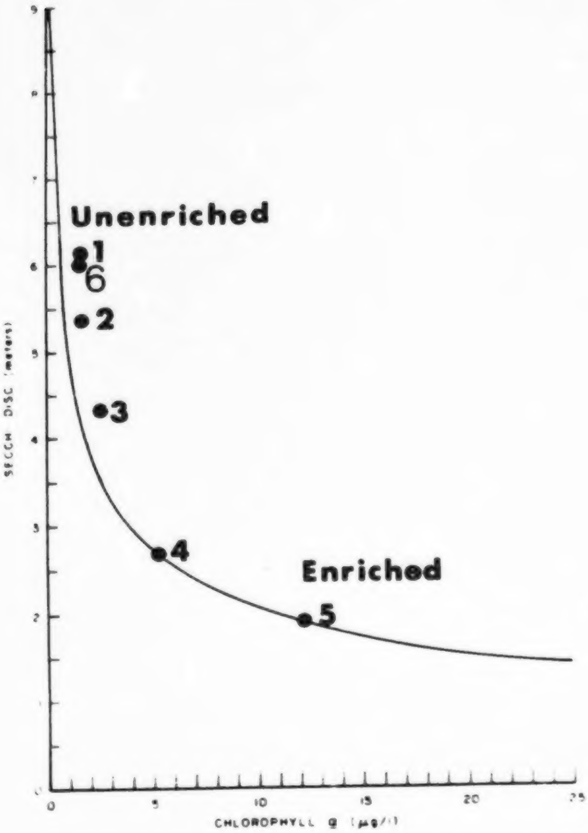
The Secchi disc readings at station 6 ranged from 6.0 to 7.0 m and chlorophyll a concentrations ranged from 1.2 to 2.1. Because there were only 4 sampling occasions for this station the means do not represent true seasonal values. At station 13 Secchi disc readings ranged from 5.25 to 6.75 m and chlorophyll a concentrations ranged from 1.1 to 2.0 ug/L. Based on the seasonal means for the two parameters measured, Miskwabi Lake would be considered unenriched, characterized by a high degree of water transparency and low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the program functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Miskwabi Lake from 1975 to 1981.

Station	6 (West)		13 (East)	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973				
1974				
1975	7.7*	1.6*	7.0*	1.6*
1976	6.4	1.6	5.6	2.2
1977	7.9	- -	5.9	- -
1978	6.5	1.5	5.8	2.1
1979	6.6**	1.7**	5.6	2.0
1980	6.6**	2.5**	5.8	2.2
1981	6.5**	1.5**	6.0	1.6

* MOE data
** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Miskwabi Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Miskwabi Lake - 1981 Station 13

An excellent sampling program was conducted on station 13 of Miskwabi Lake in 1981. The results of this program as compared to data obtained since 1975 indicate that Miskwabi Lake has a stable enrichment status with very little yearly variation in water transparency or densities of suspended algae. We hope that participation in this program continues in order to monitor any long-term changes in enrichment status of Miskwabi Lake.

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Morrison Lake

Wood Ward

Town of Gravenhurst

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Morrison Lake in 1981.

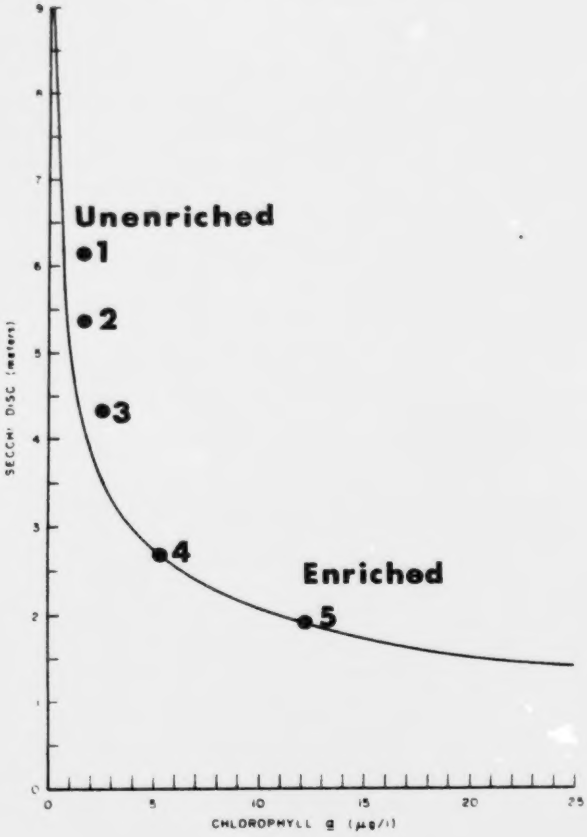
Station	1 Between Islands		2 Stafflinfats Bay		3 SE Bay		4 NW Bay		5 Riley's Bay		6 East Straight	
Date	S.D.	CHL.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
May 24	- -	- -	- -	- -	- -	1.6	- -	2.0	- -	- -	- -	- -
26	- -	- -	- -	- -	- -	0.9	- -	0.9	- -	- -	- -	- -
31	- -	1.5	- -	1.9	- -	- -	- -	- -	- -	- -	- -	- -
June 14	- -	- -	- -	- -	- -	2.4	- -	- -	- -	1.6	- -	- -
29	- -	- -	- -	--	- -	2.6	- -	- -	- -	- -	- -	2.2

Unfortunately, in 1981, sufficient sampling was not done and, as a result, no useful information was obtained. For the 1982 program, we recommend that 1 or 2 stations be sampled at least six times from the period of May to September. It is essential that the sampling date, location and measured Secchi disc reading be recorded on the submission sheets, otherwise, this information cannot be retrieved. It is not known whether any of the stations sampled in 1981 are the same locations as 1979 (Table 2). Please notify us if they are the same locations.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Morrison Lake in 1979.

Station	A		B	
Year	S.D.	Chl. a	S.D.	Chl. a
1971				
1972				
1973				
1974				
1975				
1976				
1977				
1978				
1979	2.3	4.8	2.8	3.9
1980	--	- -	- -	- -
1981	- -	- -	- -	- -

Figure 1: The relationship between Secchi disc and chlorophyll a for   and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6.

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Mountain Lake

Minden Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Mountain Lake in 1981.

Station	South		North	
Date	S.D.	Chl.a	S.D.	Chl.a
June 14	- -	1.8	- -	1.9
21	5.0	1.9	5.0	2.1
28	4.5	2.1	4.5	1.9
July 12	5.5	1.6	5.5	1.1
19	5.5	1.3	5.0	1.3
26	6.0	DM	6.25	DM
Aug. 3	4.0	DM	4.0	DM
9	4.25	1.8	3.5	1.9
16	3.25	1.9	3.25	1.3
23	5.0	1.6	4.5	1.5
30	4.25	1.2	5.0	1.4
Sept. 7	5.25	1.3	4.75	1.2
Mean	4.8	1.7	4.7	1.6

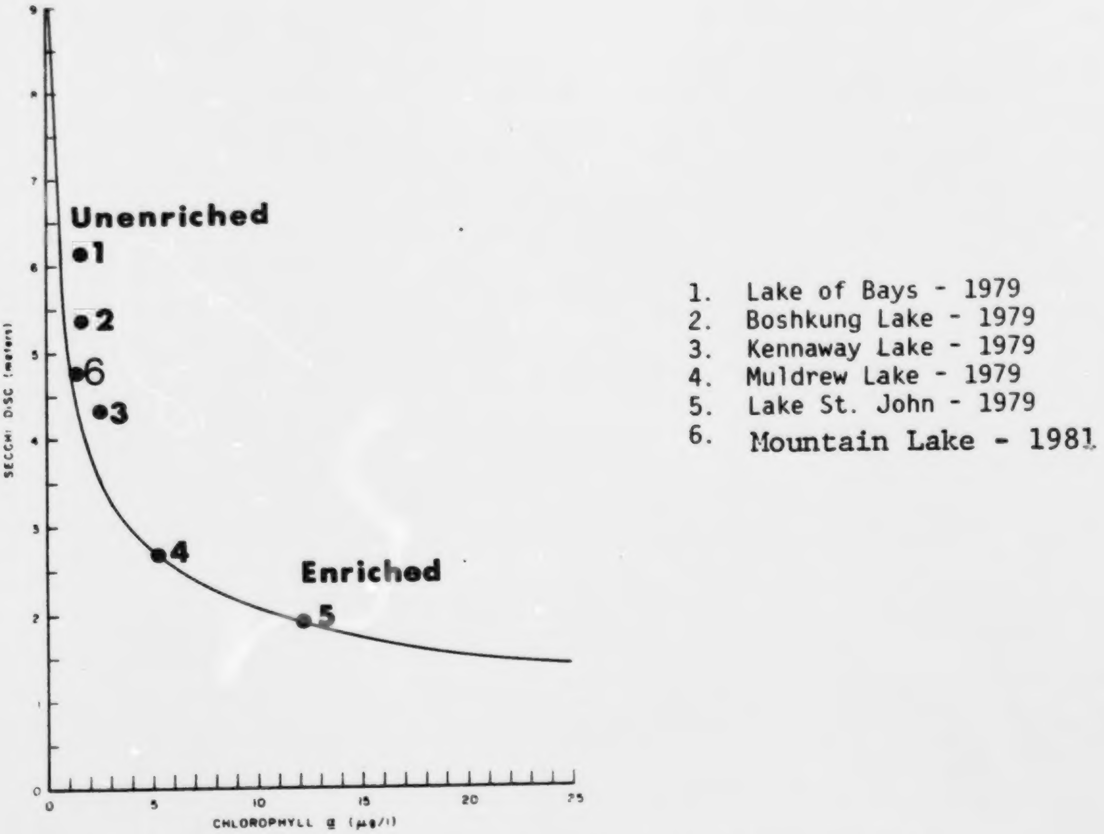
D.M. - data missing

The Secchi disc readings ranged from 3.25 to 6.0 m at the south station and from 3.25 to 6.25 m at the north station. The chlorophyll a concentrations ranged from 1.2 to 2.1 ug/L at the south station and from 1.1 to 2.1 ug/L at the north station. Based on the seasonal means for the two parameters measured, Mountain Lake would be considered unenriched, characterized by a moderately high degree of water transparency and low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Mountain Lake from 1979 to 1981.

Station	South		North	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973				
1974				
1975				
1976				
1977				
1978				
1979	5.9	1.8	5.6	1.6
1980	5.5	1.7	4.9	2.0
1981	4.8	1.7	4.7	1.6

Figure 1: The relationship between Secchi disc and chlorophyll a for Mountain Lake and a number of recreational lakes in the province. All data are seasonal means.



An excellent sampling program was conducted on Mountain Lake in 1981. Since 1979, the enrichment status of Mountain Lake has remained relatively stable. Average Secchi disc readings have been consistently high and average chlorophyll a concentrations have been consistently low for the past three years. We hope that participation in this program continues in order to establish a long-term historical record of enrichment status for Mountain Lake.

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Muldrew Lake

Muskoka, Wood and Morrison Wards

Town of Gravenhurst

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Muldrew Lake in 1981.

Station	North Lake		Miramichi		North End	
Date	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
June 12	3.3	2.4	4.0	3.2		
22	3.0	5.2	3.4	3.2		
July 26	3.0	10.0	3.3	4.5		
Aug. 2	3.0	6.3	2.7	3.7		
9	3.6	5.3	3.6	6.9	7.0	5.2
16	4.0	6.3	3.0	6.5	3.0	1.9
23	3.7	5.5	3.7	4.1	2.6	4.2
Sept. 1	- -	- -	- -	- -	D.M.	9.7
Mean	3.4	5.9	3.4	4.6	4.2	5.3

D.M. - missing data

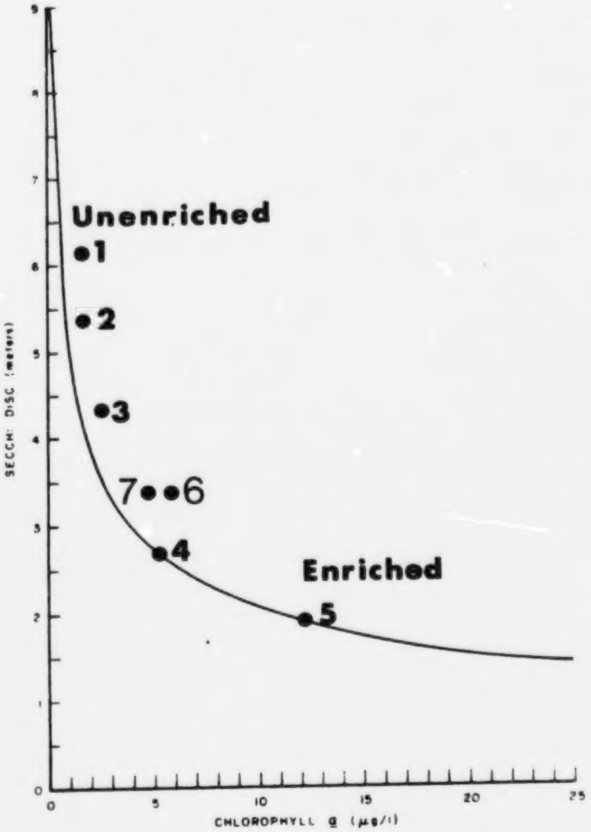
The Secchi disc readings for North Lake and Miramichi were similar ranging from 2.7 to 4.0 m. Chlorophyll a concentrations were also similar at both stations ranging from 2.4 to 10.0 ug/L. Insufficient data was collected at North End station to determine any similarities to other stations. Based on the seasonal means, Muldrew Lake would be considered enriched, characterized by a moderately low degree of water transparency and high densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Muldrew Lake from 1976 to 1981.

Station	North Lake		Miramachi		North End	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1971						
1972						
1973						
1974						
1975						
1976	3.9*	2.9*				
1977	3.7	- -				
1978	3.0*	1.9*				
1979	2.7	5.0				
1980	3.5	4.0	3.1*	3.8*		
1981	3.4	5.9	3.4	4.6	4.2	5.3

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Muldrew Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Muldrew Lake - 1981 North Lake
7. Miramichi

An excellent sampling program was conducted at the North Lake and Miramichi stations of Muldrew Lake in 1981. Based on data available since 1976, average Secchi disc readings have shown very little variation ranging from 2.7 to 3.9 m at North Lake. Average chlorophyll a concentrations exhibited greater variation ranging from 1.9 to 5.9 ug/L at North Lake. This variation could be due to the low sampling frequency in 1976 and 1979 which resulted in mean values which were uncharacteristic of the seasonal average. Insufficient data is available from other stations to establish any long-term trends in enrichment status. We hope participation in this program continues to establish a good historical record for Muldrew Lake.

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DON MILLS, Ontario, M3C 3C3, Telephone: (416) 424-3000, Attention: Dhan Sharma

Muskoka Bay

Muskoka Ward

Town of Gravenhurst

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Muskoka Bay in 1981.

Station	1		2		3	
	Parker's Point		Cliff Rock		Centre Bay	
Date	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
May 31	2.0	3.0	4.5	1.6	3.5	3.0
June 29	3.7	4.2	3.3	4.2	3.6	3.7
July 19	4.0	3.9	4.0	2.6	4.0	DM
Aug. 11	3.3	0.6	3.2	4.0	3.7	1.0
Sept.19	3.0	4.8	3.5	3.4	3.5	3.4
Oct. 24	3.0	2.4	3.0	3.8	3.5	3.2
Mean	3.2	3.2	3.6	3.3	3.6	2.9

D.M. - data missing

The Secchi disc readings ranged from 2.0 to 4.0 m at Parker's Point, from 3.0 to 4.5 m at Cliff Rock and from 3.5 to 4.0 m at Centre Bay. The chlorophyll a concentrations ranged from 0.6 to 4.8 ug/L at Parker's point, from 1.6 to 4.2 ug/L at Cliff Rock and from 1.0 to 3.7 ug/L at Centre Bay. Based on the seasonal means, Muskoka Bay would be considered moderately enriched, characterized by a moderate degree of water transparency and moderate densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

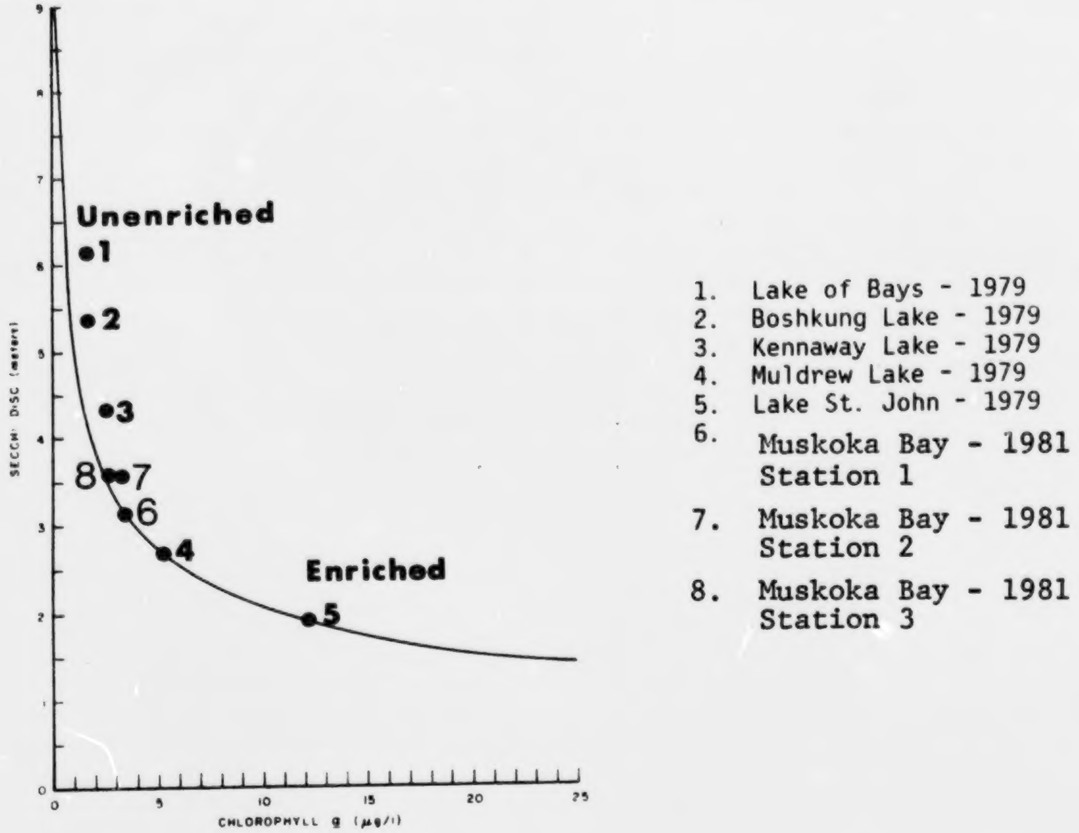
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Muskoka Bay from 1971 to 1981.

Station	1		2		3	
	Parker's Point		Cliff Rock		Centre Bay	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
*1971	1.9	13.8				
*1972	3.1	8.1				
*1973	3.2	6.9				
*1974	2.7	5.0				
*1975	3.9	5.0				
*1976	3.7	10.6				
1977	**4.3(4.2*)	- -(2.3*)	4.1**	- -		
1978	4.8(4.2*)	2.5(3.5*)	4.8	2.3		
1979	**5.3(3.3*)	2.6**(6.1*)	4.8**	3.9**		
1980	2.2(2.6*)	9.0(10.3*)	2.0	6.8	3.7	9.3
1981	3.2	3.2	3.6	3.3	3.6	2.9

* MOE data

** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Muskoka Bay and a number of recreational lakes in the province. All data are seasonal means.



In 1981, an excellent sampling program was conducted on Muskoka Bay. The results of this program indicate that the degree of water transparency has remained relatively constant since 1971, while densities of suspended algae have decreased. We hope that participation in this program continues in order to monitor long-term changes in enrichment status.

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Nine Mile Lake

Wood Ward

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Nine Mile Lake in 1981.

Station	Main		Southeast	
Date	S.D.	Chl.a	S.D.	Chl.a
May 18	- -	- -	2.65	0.7
24	- -	- -	3.05	1.8
June 7	- -	- -	2.85	2.6
28	- -	- -	2.8	1.8
July 5	- -	- -	3.0	2.4
6	2.5	1.8	- -	- -
12	- -	- -	3.1	1.7
13	3.0	1.8	- -	- -
19	- -	- -	3.1	DM
26	- -	- -	3.1	DM
27	3.15	1.7	- -	- -
Aug. 3	- -	- -	3.15	2.2
10	- -	- -	3.15	5.9
16	2.5	0.2	2.8	2.3
23	- -	- -	3.0	2.6
Sept. 7	- -	- -	3.1	2.0
14	3.0	3.1	- -	- -
20	- -	- -	2.8	5.8
Mean	2.8	1.7	3.0	2.7

DM - data missing

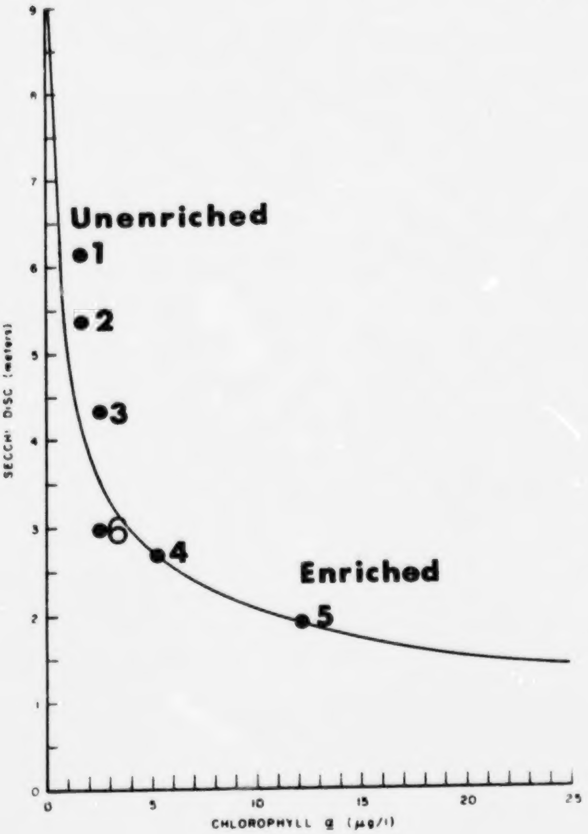
The Secchi disc readings ranged from 2.5 to 3.15 m at the main station and from 2.65 to 3.15 m at the southeast station. The low degree of water transparency in Nine Mile Lake is due primarily to the natural brown colouration of the water resulting from humic or peaty deposits in the area. The chlorophyll a concentrations ranged from 0.2 to 3.1 ug/L at the main station and from 0.7 to 5.9 ug/L at the southeast station. Based on the available information, Nine Mile Lake would be considered moderately enriched, characterized by a moderately low degree of transparency and moderately low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Nine Mile Lake from 1979 to 1981.

Station	Main		Southeast	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973				
1974				
1975				
1976				
1977				
1978				
1979	2.9	5.0	- -	- -
1980	2.7	3.8	2.3	3.7
1981	*2.8(2.7**)	*1.7(2.4**)	3.0	2.7

*based on less than 6 samples
**MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Nine Mile Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Nine Mile Lake-1981 Southeast

In 1981, a complete water quality survey was conducted on Nine Mile Lake by MOE. The results of this program are included with the historical Self-Help data on Table 2. Since 1979, the degree of water transparency has remained relatively unchanged but the average chlorophyll a concentrations in 1981 were lower than previous years. We hope that participation in this program continues in order to determine whether this condition persists or is simply the result of the natural yearly fluctuation in algal densities.

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Orr Lake

Flos Township

Simcoe County

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Orr Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
Aug. 16	1.2	1.6

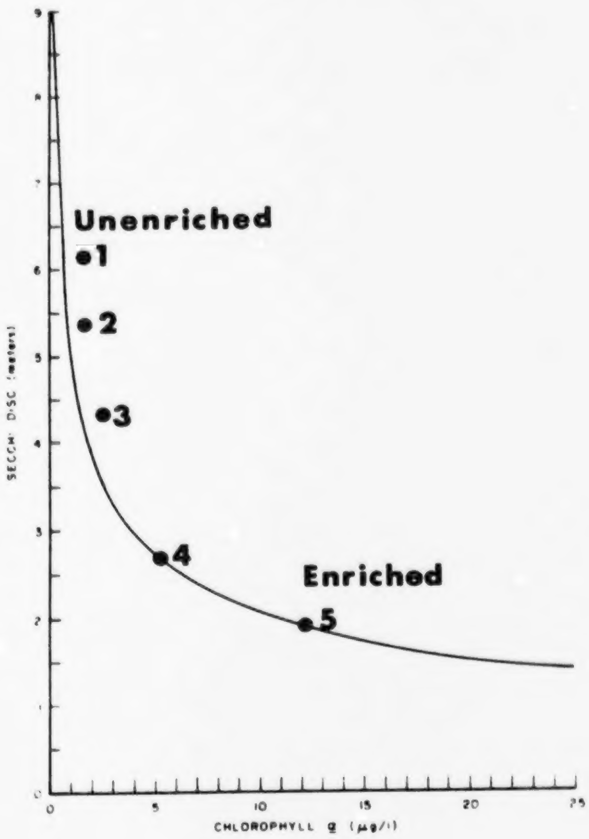
Insufficient sampling was done in 1981 to draw any meaningful conclusions.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Orr Lake in 1980 and 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977		
1978		
1979		
1980	2.1*	0.9*
1981	1.2*	1.6*

* based on 1 sample

Figure 1: The relationship between Secchi disc and chlorophyll $\underline{a}$ for and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6.

We hope that sampling frequency increases in 1982.

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Percy Lake

Harburn Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Percy Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
May 19	3.5	1.2
June 14	3.5	1.3
26	3.25	2.6
July 3	4.25	2.1
13	3.75	4.4
19	4.5	2.4
26	4.5	DM
Aug. 3	4.5	DM
23	4.5	3.0
30	4.5	2.9
Mean	4.1	2.5

D.M. - data missing

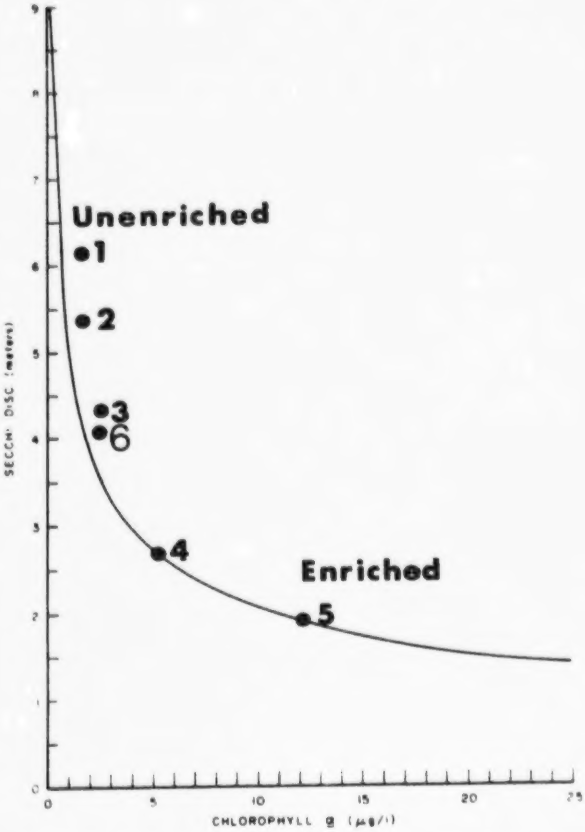
The Secchi disc readings ranged from 3.25 to 4.5 m and chlorophyll a concentrations ranged from 1.2 to 4.4 ug/L during the sampling period. Based on the seasonal means for the two parameters measured, Percy Lake would be considered moderately enriched, characterized by a moderately high degree of water transparency and moderately low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Percy Lake from 1977 to 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977	5.1*	2.0*
1978	4.1	2.2
1979	4.4	2.1
1980	3.3	3.3
1981	4.1	2.5

* MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Percy Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Percy Lake - 1981

An excellent sampling program was conducted on Percy Lake in 1981. There has been very little change in the condition of Percy Lake since 1977. The average Secchi disc readings have ranged from 3.1 to 5.1 m and average chlorophyll a concentrations have ranged from 2.0 to 3.3 ug/L. The 1977 MOE Survey of Percy Lake determined that the water quality was good, characterized by low nutrient levels. We hope that participation in this program continues in order to maintain the historical record of enrichment status for Perry Lake.

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Pine Lake

Muskoka and Wood Wards

Town of Gravenhurst

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Pine Lake in 1981.

Station	Upper 1st		Lower 2nd	
Date	S.D.	Chl.a	S.D.	Chl.a
May 18	2.7	1.5	3.0	1.9
June 14	2.0	4.6	2.1	1.9
July 4	3.0	3.6	2.8	4.4
Aug. 30	3.5	2.8	3.5	3.5
Sept.13	3.0	3.1	3.25	3.7
Oct. 11	3.0	4.8	3.25	1.8
Mean	2.9	3.4	3.0	2.9

The Secchi disc readings ranged from 2.0 to 3.5 m at the upper 1st lake station and from 2.1 to 3.5 m at the lower 2nd lake station. Chlorophyll a concentrations ranged from 1.5 to 4.8 ug/L at the Upper 1st lake station and from 1.8 to 4.4 ug/L at the Lower 2nd lake station. Based on the seasonal means, Pine Lake would be considered moderately enriched, characterized by a moderately low degree of water transparency and moderate densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Pine Lake from 1979 to 1981.

Station	Upper 1st Lake		Lower 2nd Lake	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973				
1974				
1975				
1976				
1977				
1978				
1979	3.4	2.8	3.4	3.2
1980	2.9	5.1	3.0	4.8
1981	2.9	3.4	3.0	2.9

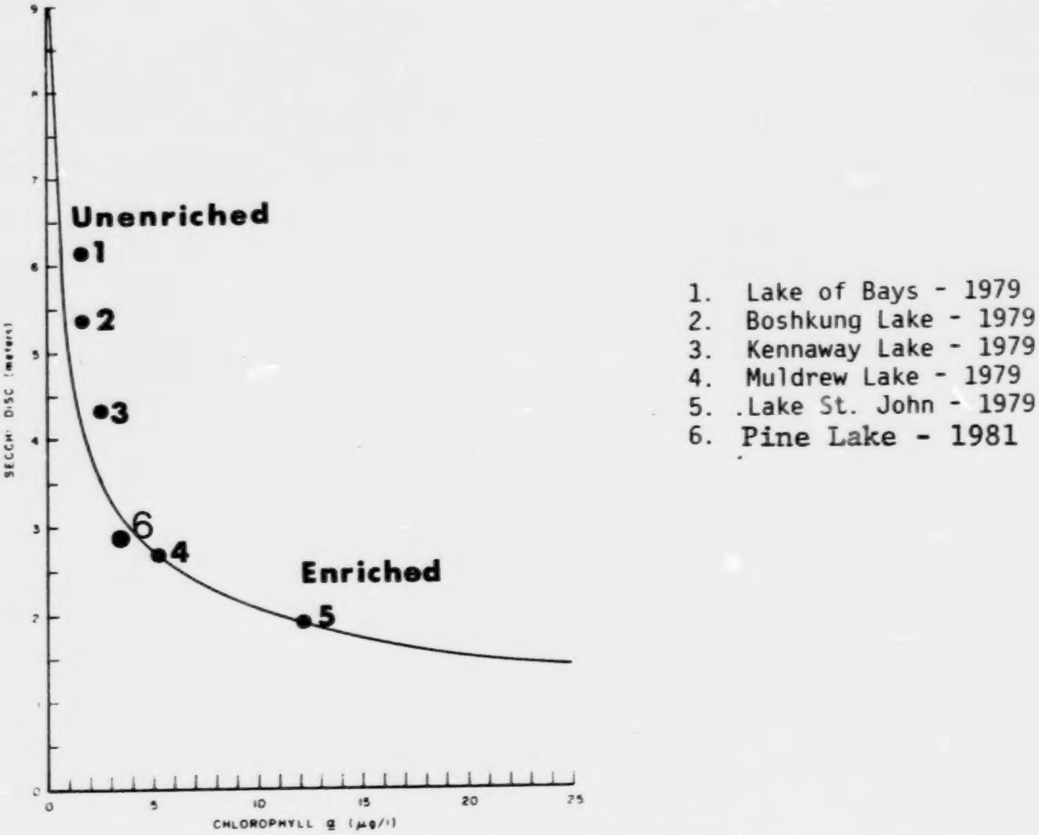

Figure 1: The relationship between Secchi disc and chlorophyll a for Pine Lake and a number of recreational lakes in the province. All data are seasonal means.

A good sampling program was conducted on Pine Lake in 1981. Since 1979, there has been no apparent change in the enrichment status of Pine Lake. Average chlorophyll a concentrations have exhibited some yearly variation due to periodic increases in densities of suspended algae. We hope that participation in this program continues so that we can monitor any long-term water quality trends.

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Pine Lake

Oakley Ward

Town of Bracebridge

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Pine Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
June 7	5.3	1.5
July 5	4.5	3.4
24	4.2	2.5
Aug.11	4.2	1.7
23	4.4	1.2
Mean	4.5	2.1

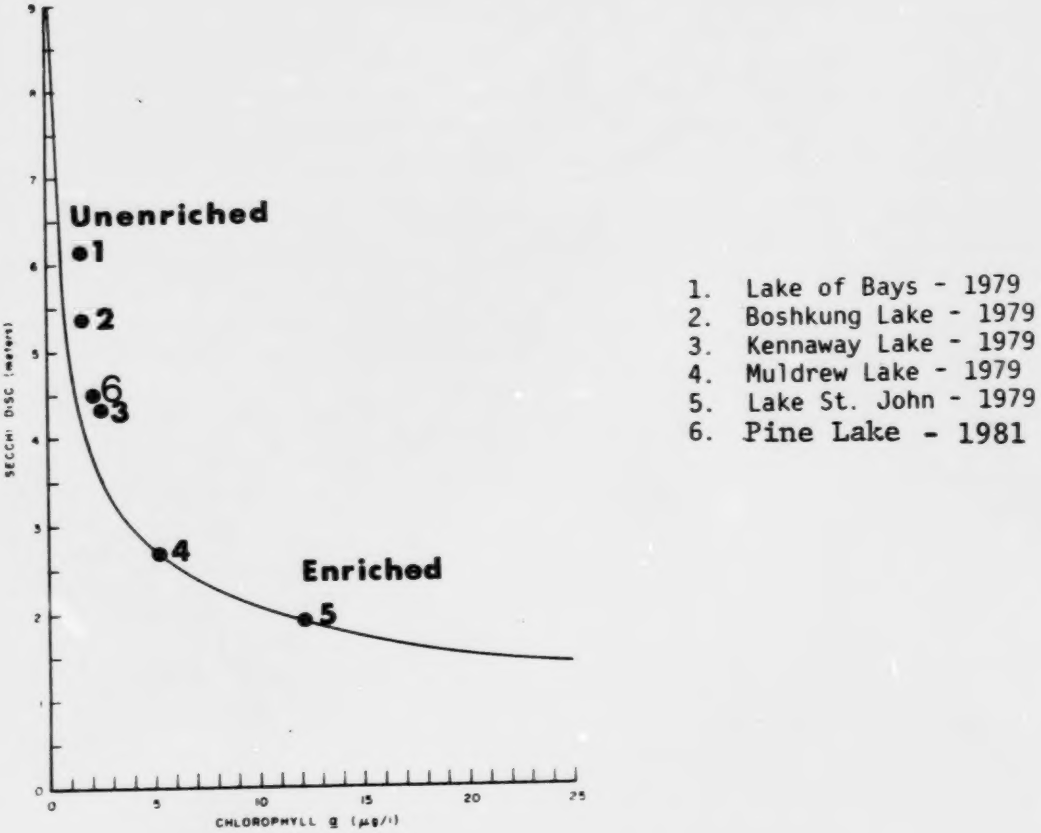
The Secchi disc readings ranged from 4.2 to 5.3 m and chlorophyll a concentrations ranged from 1.2 to 3.4 ug/L during the sampling period. Based on the means available for the two parameters measured, Pine Lake would be considered moderately enriched, characterized by a moderately high degree of water transparency and moderately low densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Pine Lake from 1974 to 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974	5.0	1.5
1975	5.7	1.8
1976	- -	- -
1977	5.0	- -
1978	- -	- -
1979	4.4*	2.1*
1980	4.7	3.1
1981	4.5*	2.1*

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Pine Lake and a number of recreational lakes in the province. All data are seasonal means.



Since 1974 average Secchi disc readings have decreased slightly from 5.7 m in 1975 to 4.5 m in 1981. Average chlorophyll a concentrations have increased slightly from 1.5 ug/L in 1975 to 2.1 ug/L in 1981. These changes have resulted in a change in enrichment status from unenriched in 1974/75 to moderately enriched from 1979 to 1981. We recommend that participation in this program continue and a mininum of 6 samples be taken during the period of May to September in order to determine if this represents a long-term change in enrichment status or simply the natural yearly fluctuations in densities of suspended algae.

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Ril Lake

Ridout Ward

Township of Lake of Bays

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Ril Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
June 2	2.5	3.4
July 1	3.0	4.1
15	3.0	13.0
29	2.5	DM
Aug. 12	3.0	5.6
25	3.75	2.7
Sept. 9	2.75	5.9
Mean	2.9	5.8

DM - data missing

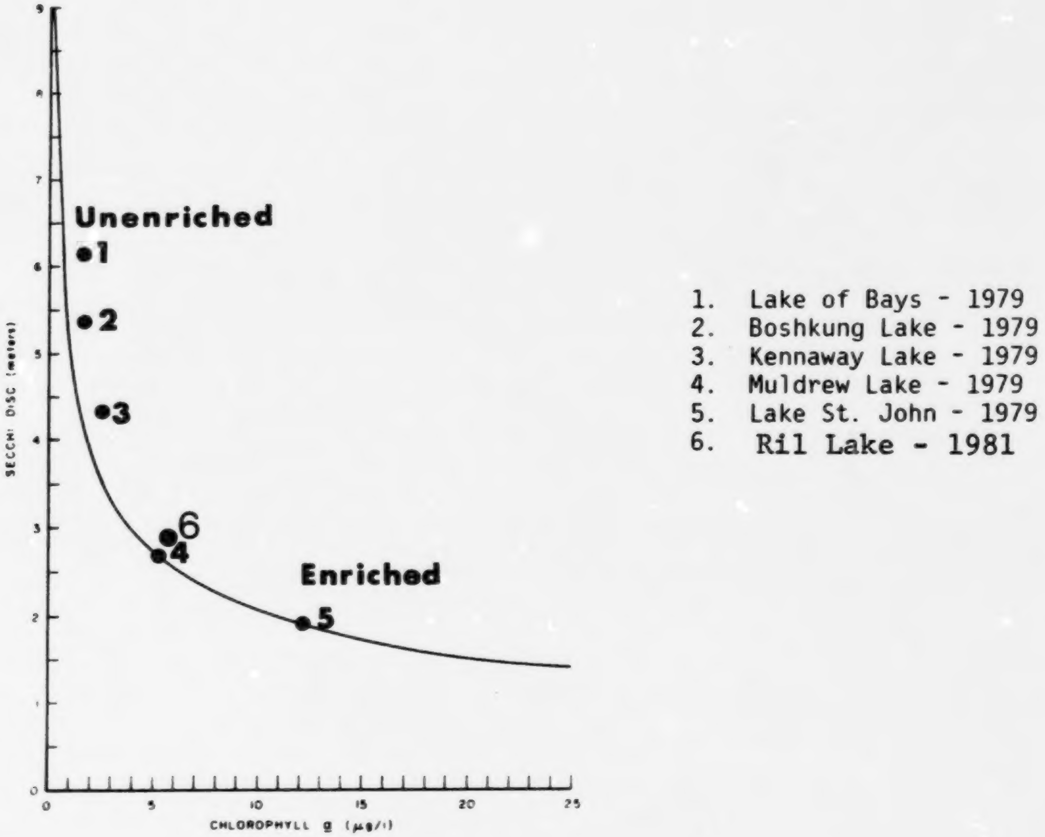
The Secchi disc readings ranged from 2.5 to 3.75 m and chlorophyll a concentrations ranged from 2.7 to 13.0 ug/L. Densities of suspended algae were quite high on July 15. Based on the seasonal means for the two parameters measured Ril Lake would be considered enriched characterized by high densities of suspended algae and a low degree of water transparency. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Ril Lake from 1972 to 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972	2.5*	4.3*
1973		
1974		
1975		
1976	3.3	3.9
1977	3.0	- -
1978	3.1	3.8
1979	2.5	5.1
1980	2.5	4.5
1981	2.9	5.8

*MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Ril Lake and a number of recreational lakes in the province. All data are seasonal means.



An excellent sampling program has been conducted on Ril Lake since 1976. In 1972 an MOE Survey was conducted and the results of that survey indicated that Ril Lake was enriched. Since that time, the enrichment status has changed to moderately enriched from 1976 to 1978 then back to enriched from 1979 to 1981. The 1972 survey also determined that Ril Lake was moderately brown coloured with natural humic substances. This could decrease the degree of water transparency somewhat. Periodically high densities of suspended algae in moderately enriched lakes such as Ril Lake, reduce transparency and increase chlorophyll a levels. We hope that we can monitor any long-term changes in enrichment status.

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Round Lake

Belmont Township

Peterborough County

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Round Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
July 12	3.5	4.8

Insufficient sampling was done to make meaningful conclusions.

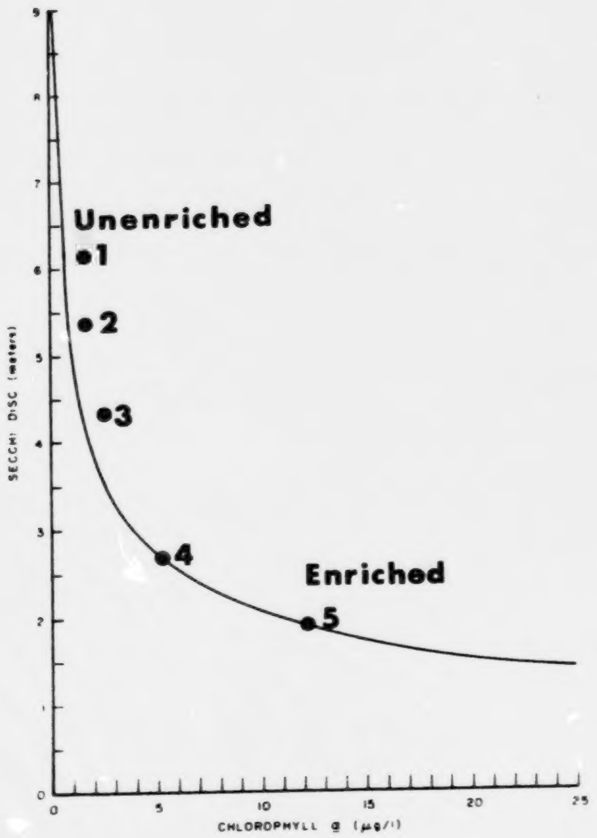
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Round Lake from 1977 to 1981.

Station		
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977	2.9	- -
1978	3.3 (4.0*)	2.5 (2.6*)
1979	3.8	2.8
1980	- -	- -
1981	3.5**	4.8**

* MOE survey

** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll *a* for and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6.

We hope that sampling frequency in 1982 increases.

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Salerno Lake

Snowdon & Glamorgan Townships

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Salerno Lake in 1981.

Station	A (South)		B (North)	
Date	S.D.	Chl.a	S.D.	Chl.a
June 28	4.5	2.9	6.0	2.3
July 12	5.0	4.3	5.5	2.9
19	5.0	4.8	5.5	3.7
26	4.5	DM	6.0	DM
Aug. 3	4.0	DM	4.5	DM
9	3.0	6.5	4.5	5.0
23	6.0	5.1	5.0	3.5
30	4.0	4.3	4.5	4.6
Mean	4.5	4.7	5.2	3.7

DM - data missing

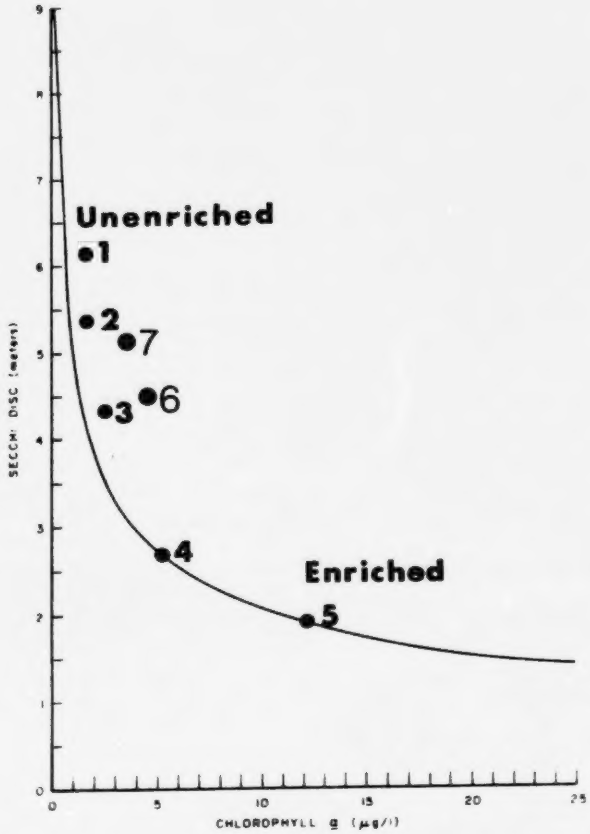
The Secchi disc readings ranged from 3.0 to 6.0 m at the south station and from 4.5 to 6.0 m at the north station. Chlorophyll a concentrations ranged from 2.9 to 6.5 ug/L at the south station and from 2.3 to 5.0 ug/L at the north station. Based on the seasonal means for the two parameters measured, Salerno Lake would be considered moderately enriched, characterized by a moderately high degre of water transparency and high densitie of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Salerno Lake from 1973 to 1981.

Station	A (South)		B (North)	
Year	S.D.	Chl.a	S.D.	Chl.a
1971				
1972				
1973	6.0*	2.0*		
1974	- -	- -		
1975	3.6	4.0	4.5	2.2
1976	3.6	3.0	3.9	2.6
1977	4.1	- -	4.4	- -
1978	4.0**	3.7**	4.3**	3.0**
1979	5.0**	3.7**	5.0**	3.7**
1980	4.2	3.8	4.4	4.8
1981	4.5	4.7	5.2	3.7

* Mean of 5 stations
** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll *a* for Salerno Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Salerno Lake - 1981 Station A
7. Salerno Lake - 1981 Station B

An excellent sampling program was conducted on Salerno Lake in 1981. Over the past 7 years conditions have not changed significantly in the lake. In 1973, conditions observed were much better than in subsequent years, however these values were not true seasonal means. We hope that participation in this program continues so that we can monitor any long-term changes in enrichment status.

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Six Mile Lake

Baxter Ward

Township of Georgian Bay

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Six Mile Lake in 1981.

Station	North (Crooked Bay)		South (Lost Channel)	
Date	S.D.	Chl.a	S.D.	Chl.a
May 18	4.5	1.7	3.2	DM
31	2.8	4.7	2.8	3.6
June 7	3.5	3.5	3.0	4.3
21	3.25	4.7	3.35	4.6
29	4.0	3.0	4.0	4.4
July 5	5.75	2.4	4.5	3.3
19	4.5	2.5	5.0	2.0
26	5.5	DM	5.0	DM
Aug. 3	5.0	DM	4.25	DM
9	5.5	2.7	4.5	2.9
23	4.5	0.9	4.5	1.0
23	6.2	1.3	5.5	1.8
30	4.0	1.6	4.5	1.6
Sept13	5.5	0.9	3.5	2.8
Mean	4.6	2.5	4.1	2.9

DM - data missing

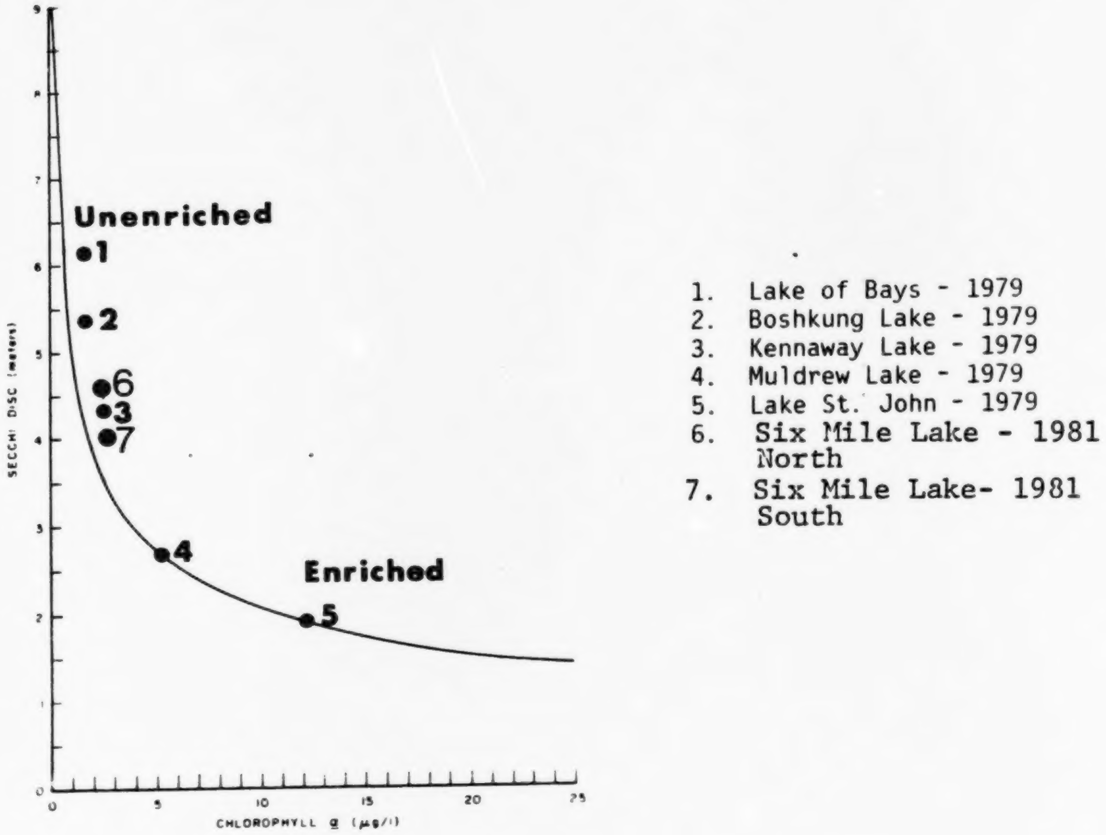
The Secchi disc readings at North station ranged from 2.8 to 6.2 m and South station ranged from 2.8 to 5.5 m. Chlorophyll a concentrations ranged from 0.9 to 4.7 ug/L at North station and south station ranged from 1.6 to 4.6 ug/L. Based on the seasonal means Six Mile Lake would be considered moderately enriched, characterized by a moderately high degree of water transparency and moderately low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Six Mile Lake from 1977 to 1981.

Station	North (Crooked Bay)		South (Lost Channel)		Main Basin	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1971						
1972						
1973						
1974						
1975						
1976						
1977	4.1	- -	4.1	- -		
1978	4.1	2.4	3.8	2.9		
1979	5.6	2.2	5.5	2.4		
1980	4.4	2.5	3.4	3.7		
1981	4.6	2.5	4.1	2.9	4.2*	2.0*

* MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Six Mile Lake and a number of recreational lakes in the province. All data are seasonal means.



Once again an excellent sampling program was conducted on Six Mile Lake in 1981. Since 1977 there has been no significant change in the enrichment status of Six Mile Lake. There has been some natural yearly fluctuation but there are no obvious trends to indicate any long-term water quality changes. In 1981, an MOE water quality survey was conducted on Six Mile Lake and the results are included on Table 2. The results of this survey confirmed the enrichment status determined by the Self-Help Program. We hope that participation in this program continues se we can monitor any long-term changes in enrichment status.

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Skeleton Lake

Cardwell, Stisted, Stephenson & Watt Wards

Township of Muskoka Lakes

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Skeleton Lake in 1981.

Station Date	Middle North Shore S.D.	Middle North Shore Chl.a
June 28	9.0	0.5
July 5	11.0	0.5
12	12.0	0.6
Aug. 9	9.0	3.2
Mean	10.3	1.2

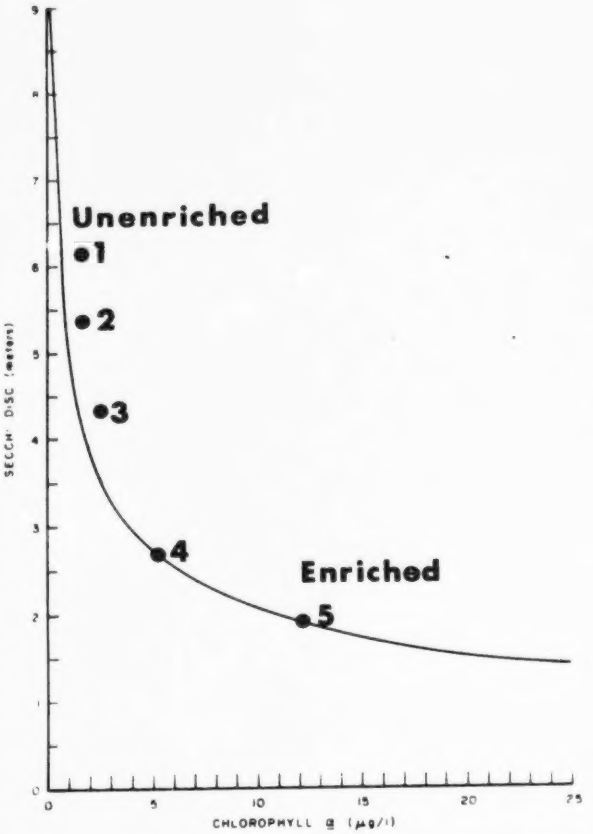
The Secchi disc readings ranged from 9.0 to 12.0 m and chlorophyll a concentrations ranged from 0.5 to 3.2 ug/L. Insufficient sampling was done to get a reliable seasonal mean, however, based on the information available SkeletonLake would be considered unenriched. The lake is characterized by a high degree of water transparency and low densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Skelton Lake from 1980 to 1981.

Station Year	Middle (North Shore) S.D.	Middle (North Shore) Chl.a	Deep Basin S.D.	Deep Basin Chl.a
1971				
1972				
1973				
1974				
1975				
1976				
1977				
1978				
1979				
1980	9.5**	1.1**		
1981	10.3**	1.2**	8.0*	0.8*

* MOE data
** based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll a for Skeleton Lake and a number of
•6 recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Skeleton Lake-1981

In 1981, MOE conducted a water quality survey on Skeleton Lake. The results of this survey are included on Table 2 and confirm the Self-Help Program results. We hope that participation in this program continues in order to establish a long-term record of water quality for Skeleton Lake.

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Soyers Lake

Minden Township
Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Soyers Lake in 1981.

Station	1	
Date	S.D.	Chl.a
May 18	- -	0.9
July 5	4.3	2.2
19	4.9	1.6
26	4.9	DM
Aug. 3	4.6	DM
9	4.7	1.8
16	4.4	4.7
30	4.9	1.8
Sept. 7	5.0	1.4
Mean	4.7	2.1

DM - data missing

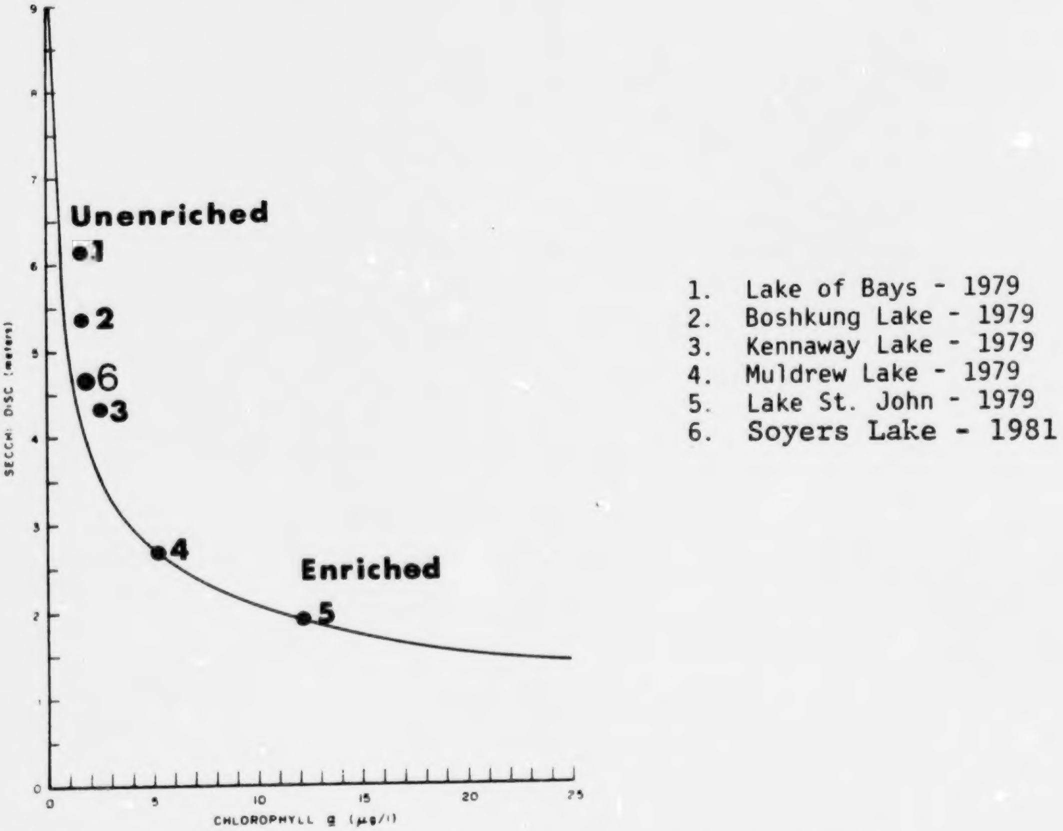
The Secchi disc readings ranged from 4.3 to 5.0 m and the chlorophyll a concentrations ranged from 0.9 to 4.7 ug/L. The degree of water transparency did not change significantly during the sampling period. Based on the seasonal means, Soyers Lake would be considered moderately enriched characterized by a moderately high degree of water transparency and moderately low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Soyers Lake from 1973 to 1981.

Station	1	
Year	S.D.	Chl.a
1971		
1972		
1973	3.8	1.7
1974	4.4*	0.9*
1975	3.5	2.1
1976	4.3	1.7
1977	5.0	- -
1978	5.2	1.8*
1979	4.5	2.2
1980	4.1	2.6
1981	4.7	2.1

* based on less than 6 samples

Figure 1: The relationship between Secchi disc and chlorophyll *a* for Soyers Lake and a number of recreational lakes in the province. All data are seasonal means.



Once again an excellent sampling program was conducted on Soyers Lake in 1981. Since 1973, there has been no significant change in water transparency or suspended algae levels. Water quality in Soyers Lake has bordered between moderately enriched and unenriched since the initiation of the Self-Help Program. The enrichment status designation depends on whether or not there were periodically high densities of suspended algae during the sampling period. We hope that participation in this program continues so that we can monitor any long-term changes in the enrichment status.

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Sparrow Lake

Morrison Ward

Town of Gravenhurst

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Sparrow Lake in 1981.

Station		1		2		3		4		5		6	
		Delmonte		Hopper		McLean Bay		Pt. Stanton		Mid-Lake		Lauderdale	
Date		S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
May	18	1.25	3.9	1.75	3.4	1.5	2.6	- -	- -	- -	- -	- -	- -
	24	2.25	1.5	1.75	2.4	2.25	1.7	2.75	0.9	2.75	1.4	2.25	1.2
June	6	2.5	2.4	2.0	3.1	1.25	ND	- -	- -	- -	- -	- -	- -
	14	3.0	2.4	3.5	DM	1.75	2.9	3.0	1.5	- -	ND	- -	ND
21	21	2.5	2.5	1.75	2.3	2.5	2.3	- -	- -	- -	- -	- -	- -
	28	3.25	3.9	2.0	3.9	3.25	4.3	3.0	3.3	3.0	3.6	3.0	3.4
July	4	2.5	4.2	2.25	2.6	- -	4.6	3.25	1.9	3.25	2.3	3.25	2.1
	12	2.25	3.5	2.0	4.0	2.5	3.0	3.0	3.2	3.0	2.7	3.0	2.7
	18	2.5	2.5	2.75	2.3	2.7	2.3	2.75	DM	2.75	DM	2.75	DM
	25	2.5	DM	2.5*	DM	3.0	DM	3.0	DM	3.75	DM	- -	- -
Aug.	3	4.0	1.0	4.0	0.7	3.25	0.9	4.0	ND	4.25	0.5	- -	0.6
	8	4.5	4.7	4.25	0.8	3.5	2.6	3.5	1.4	3.25	0.7	3.25	1.1
	16	- -	- -	- -	- -	- -	- -	3.0	1.3	2.75	1.2	3.0	0.9
	23	3.75	3.8	3.25	2.8	3.25	2.2	3.5	3.6	3.75	3.4	3.0	3.2
	30	- -	- -	- -	- -	- -	- -	2.75	2.0	2.75	2.0	2.75	2.3
Sept.	6	2.5	1.9	2.75	2.4	2.0	4.5	2.75	2.8	3.0	2.7	2.75	2.7
	20	2.5	3.8	2.25	3.4	3.25	3.1	2.5	2.7	3.0	2.4	3.0	2.7
Mean		2.8	3.0	2.6	2.6	2.6	2.8	3.1	2.2	3.2	2.1	2.9	2.1

* Secchi disc on bottom

ND - no data; problem at lab

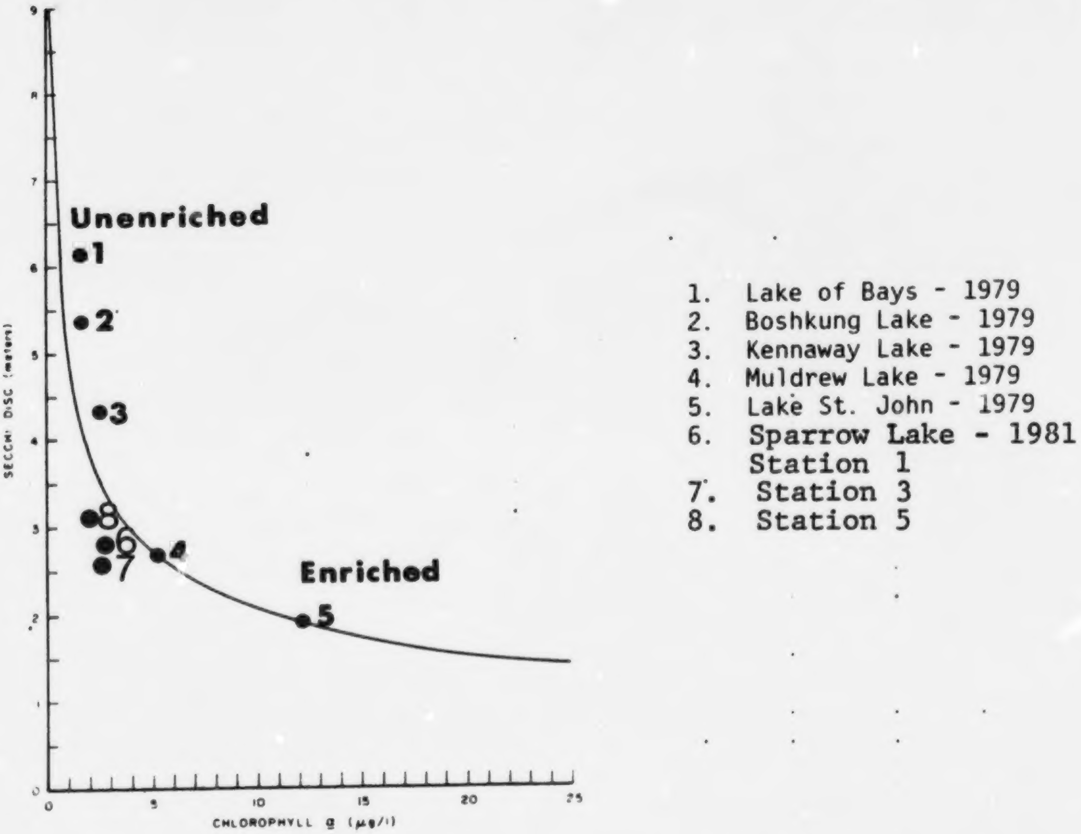
DM - data missing due to computer problem

SEE BACK OF PAGE FOR TEXT

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Sparrow Lake in 1981.

Station	1		2		3		4		5		6	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1971												
1972												
1973												
1974												
1975												
1976												
1977												
1978												
1979												
1980												
1981	2.8	3.0	2.6	2.6	2.6	2.8	3.1	2.2	3.2(3.3*)	2.1(3.0*)	2.9	2.1

Figure 1: The relationship between Secchi disc and chlorophyll a for Sparrow Lake and a number of recreational lakes in the province. All data are seasonal means.



Based on the seasonal means obtained, Sparrow Lake would be considered moderately enriched. The degree of water transparency was lower than would be expected from the moderately low densities of suspended algae observed. This could be due to the presence of dissolved and suspended material in the water originating from the watershed. There was no significant difference in water quality from station to station. We hope to have the computer problem at the lab resolved for the 1982 program. In 1981, an excellent sampling program was conducted on Sparrow Lake. In addition, MOE conducted a water quality survey of the major basin of Sparrow Lake. The results of both programs are included on Table 2. Since there is a very high flow of water through Sparrow Lake, there is a lot of dissolved and suspended material in the water. This tends to reduce the degree of water transparency. We hope that participation in this program continues so that we can monitor any long-term water quality changes.

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Tasso Lake

Finlayson Ward

Township of Lake of Bays

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Tasso Lake in 1981.

Station	1st Bay South		2nd Bay South	
Date	S.D.	Chl.a	S.D.	Chl.a
June 10	7.0	1.5	8.0	1.1
July 13	6.5	1.7	7.0	2.0
20	5.75	DM	7.0	DM
Mean	6.4	1.6	7.3	1.6

In 1981, MOE conducted a water quality survey at the major basin in Tasso Lake. Based on this information and the Self-Help data, Tasso Lake would be considered unenriched, characterized by a high degree of water transparency and low densities of suspended algae. The highest degree of water transparency and lowest densities of suspended algae occurred on May 25, 1981.

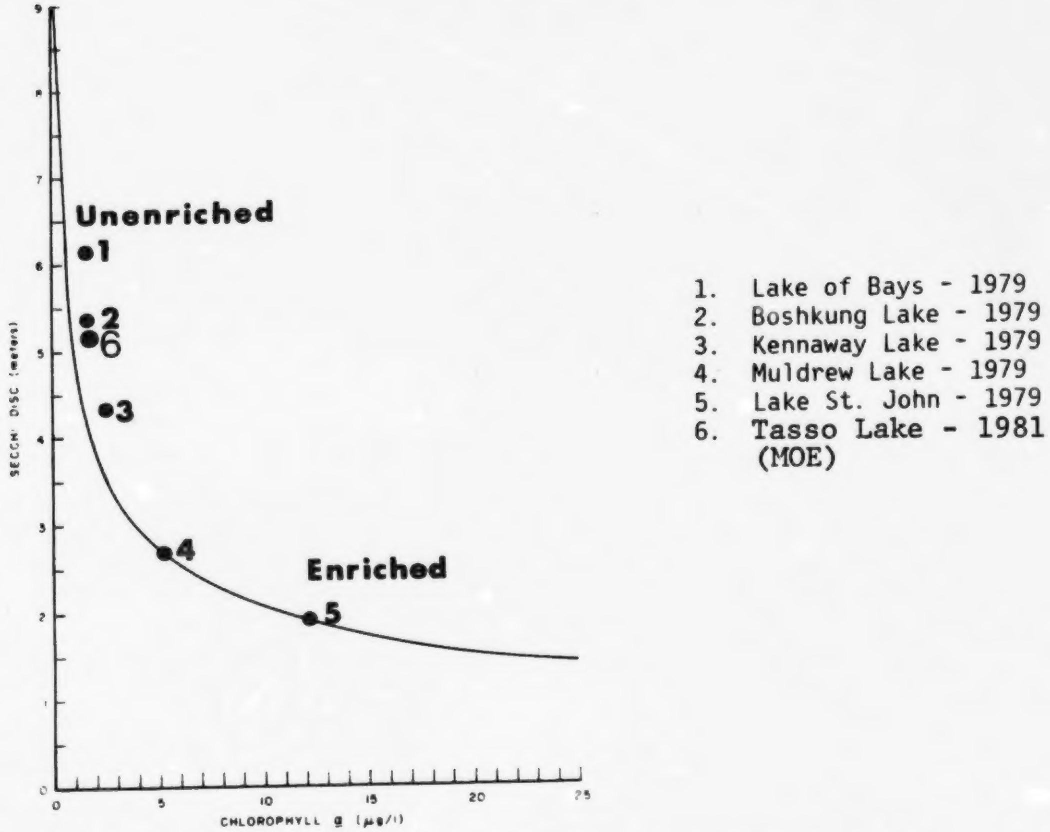
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Tasso Lake in 1980 and 1981.

Station	1st Bay South		2nd Bay South		Deep Basin	
Year	S.D.	Chl.a	S.D.	Chl.a	S.D.	Chl.a
1971						
1972						
1973						
1974						
1975						
1976						
1977						
1978						
1979						
1980	6.7*	1.3*	6.4*	2.8*		
1981	6.4*	1.6*	7.3*	1.6*	5.2**	2.0**

* based on less than 6 samples

** MOE data

Figure 1: The relationship between Secchi disc and chlorophyll *a* for Tasso Lake and a number of recreational lakes in the province. All data are seasonal means.



We recommend that the sampling frequency be increased so that we can obtain reliable seasonal means. We hope that participation in the Self-Help Program continues so that we can establish a long-term record of enrichment status for Tasso Lake.

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Tooke Lake

McLean Ward

Township of Lake of Bays

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Tooke Lake in 1981.

Station	Centre	
Date	S.D.	Chl.a
July 1	4.0	1.7
13	4.0	DM
20	4.0	1.2
Aug 23	6.0*	0.9
Sept 1	7.0*	0.6
Mean	5.0*	1.1

* Secchi disc on bottom - reading higher than noted

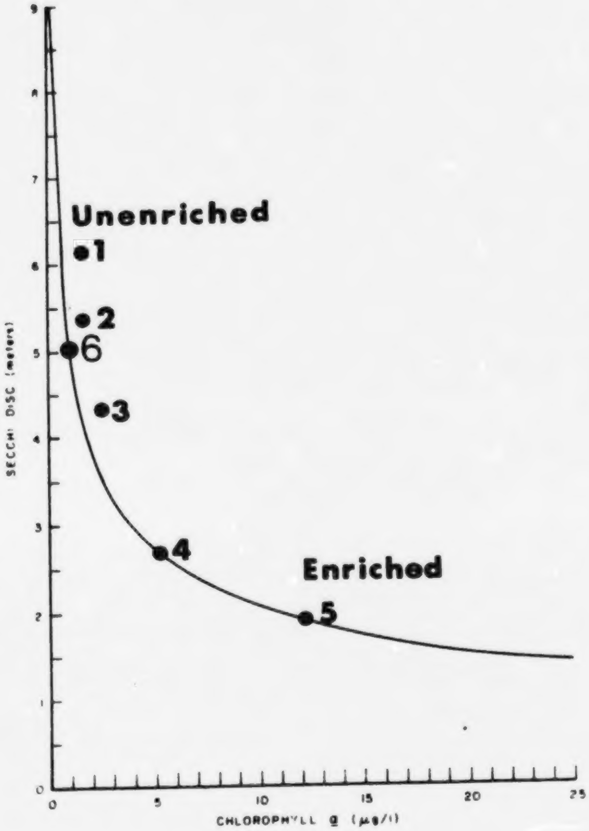
The Secchi disc readings ranged from 4 m in July to greater than 7 m in September. The chlorophyll a concentrations ranged from 0.6 to 1.7 ug/L. The highest degree of water transparency corresponded to the lowest densities of suspended algae observed in September. Based on the information available, Tooke Lake would be considered unenriched, characterized by a high degree of transparency and low densities of suspended algae. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system working properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Tooke Lake in 1981.

Station	Centre	
Year	S.D.	Chl.a
1971		
1972	4.9**	2.2**
1973		
1974		
1975		
1976		
1977		
1978		
1979		
1980		
1981	5.0*	1.1*

* based on less than 6 samples
** MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Tooke Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Tooke Lake - 1981

In 1972, MOE conducted a water quality survey on Tooke Lake. The results of that survey, compared with the 1981 Self-Help results, (Table 2) indicate that there has been no significant change in enrichment status since 1972 in Tooke Lake. We hope that participation in this program continues so that we can establish a long-term record of enrichment status in Tooke Lake.

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Twelve Mile Lake

Minden Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Twelve Mile Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
May 18	4.9	2.6
June 28	5.5	2.2
July 5	5.7	2.3
12	6.0	2.6
19	6.0	4.3
26	5.5	DM
Aug. 3	5.5	DM
9	5.0	3.3
23	5.8	5.1
30	5.5	2.1
Mean	5.5	3.1

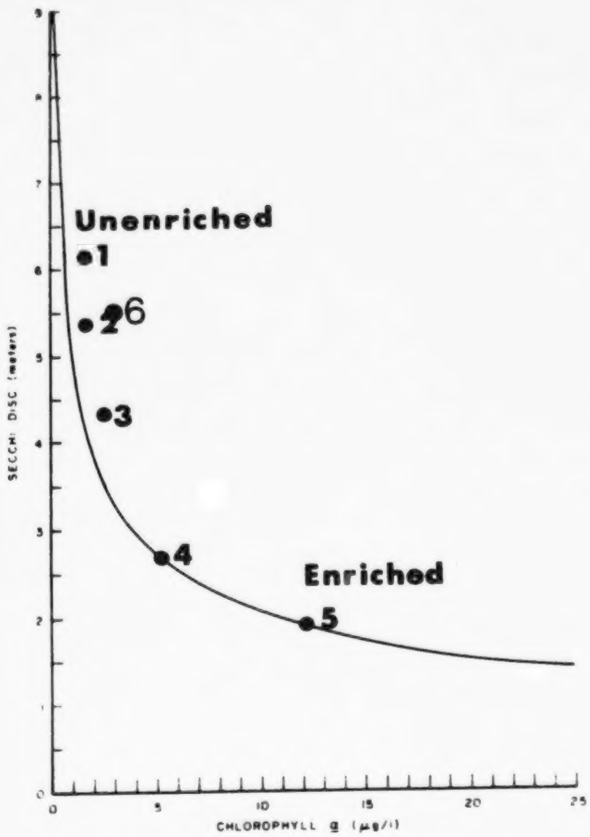
DM - data missing

The Secchi disc readings ranged from 4.9 to 6.0 m and chlorophyll a concentrations ranged from 2.1 to 5.1 ug/L during the sampling period. Based on the seasonal means for the two parameters monitored, Twelve Mile Lake would be considered moderately enriched characterized by a high degree of water transparency and moderate densities of suspended algae. The periodically high densities of suspended algae which occurred in July and August resulted in a higher average concentration of chlorophyll a. We apologize for the missing data which apparently resulted from a computer problem. We hope to have the system functioning properly for the 1982 program.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Twelve Mile Lake from 1972 to 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972	5.8	1.2
1973	6.3	1.8
1974	6.0	1.0
1975	6.9	2.5
1976	6.5	1.7
1977	6.5	- -
1978	- -	- -
1979	- -	- -
1980	5.0	2.2
1981	5.5	3.1

Figure 1: The relationship between Secchi disc and chlorophyll a for Twelve Mile Lake and a number of recreational lakes in the province. All data are seasonal means.



1. Lake of Bays - 1979
2. Boshkung Lake - 1979
3. Kennaway Lake - 1979
4. Muldrew Lake - 1979
5. Lake St. John - 1979
6. Twelve Mile Lake - 1981

Once again an excellent sampling program was conducted on Twelve Mile Lake this year. In 1981, there was an increase in the average chlorophyll a concentrations which resulted in a change in the enrichment status category for Twelve Mile Lake. This change in status is probably a temporary condition due to periodically high densities of suspended algae which occurred in 1981. We hope that participation in this program continues in order to determine any long-term changes in enrichment status of Twelve Mile Lake.

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Waseosa Lake

Chaffey Ward

Town of Huntsville

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Waseosa Lake in 1981.

Station	Main	
Date	S.D.	Chl.a
July 5	- -	3.0
Aug. 9	4.5	4.0
30	4.0	2.7
Sept.13	3.0	4.0
Mean	3.8	3.4

Insufficient sampling was done in 1981 to obtain a reliable seasonal mean. Based on the information available, Waseosa Lake would be considered moderately enriched characterized by a moderate degree of water transparency and moderate densities of suspended algae. There is a certain amount of natural brown colouration in Waseosa Lake due to humic or peaty substances in the watershed. This colouration tends to reduce the degree of water transparency.

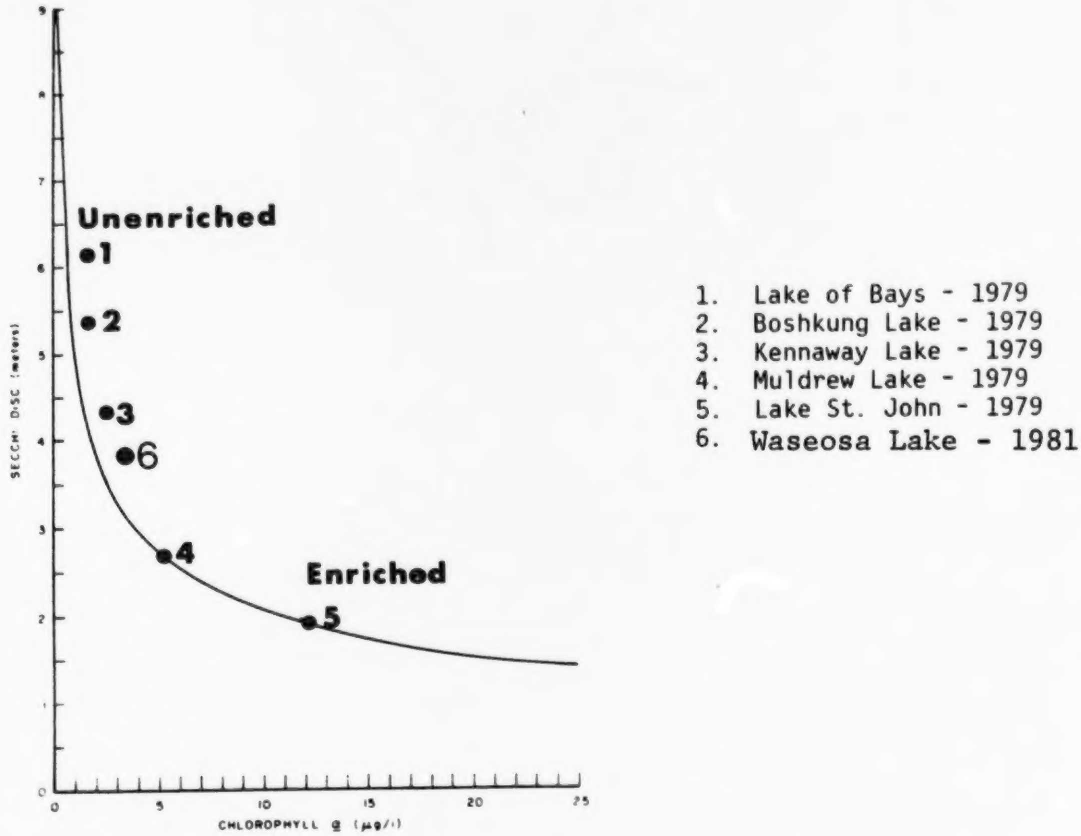
TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Waseosa Lake from 1972 to 1981.

Station	Main	
Year	S.D.	Chl.a
1971		
1972	3.1**	5.7**
1973		
1974	4.2	2.8
1975	4.1	5.2
1976	- -	- -
1977	5.1	- -
1978	4.8*	2.8*
1979	3.8*	4.4*
1980	3.7	2.6
1981	3.8*	3.4*

* Based on less than 6 samples

** MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Waseosa Lake and a number of recreational lakes in the province. All data are seasonal means.



Since 1972, there has been no significant change in the enrichment status of Waseosa Lake. Average chlorophyll a concentrations have been periodically high, ie 1972 and 1975, due to algae blooms during the sampling periods. These blooms cause short term increases in chlorophyll a concentrations and these in turn, affect the average values. We hope that participation in this program continues in order to maintain a long-term record of enrichment status.

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Wenona Lake (Little Dudmon)

Dudley Township

Provisional County of Haliburton

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Wenona Lake in 1981.

Station	North Bay	
Date	S.D.	Chl.a
May 31	6.5	3.2
June 7	6.75	1.8
14	5.5	2.2
28	6.0	1.5
July 5	5.5	2.4
19	5.5	2.2
Mean	6.0	2.2

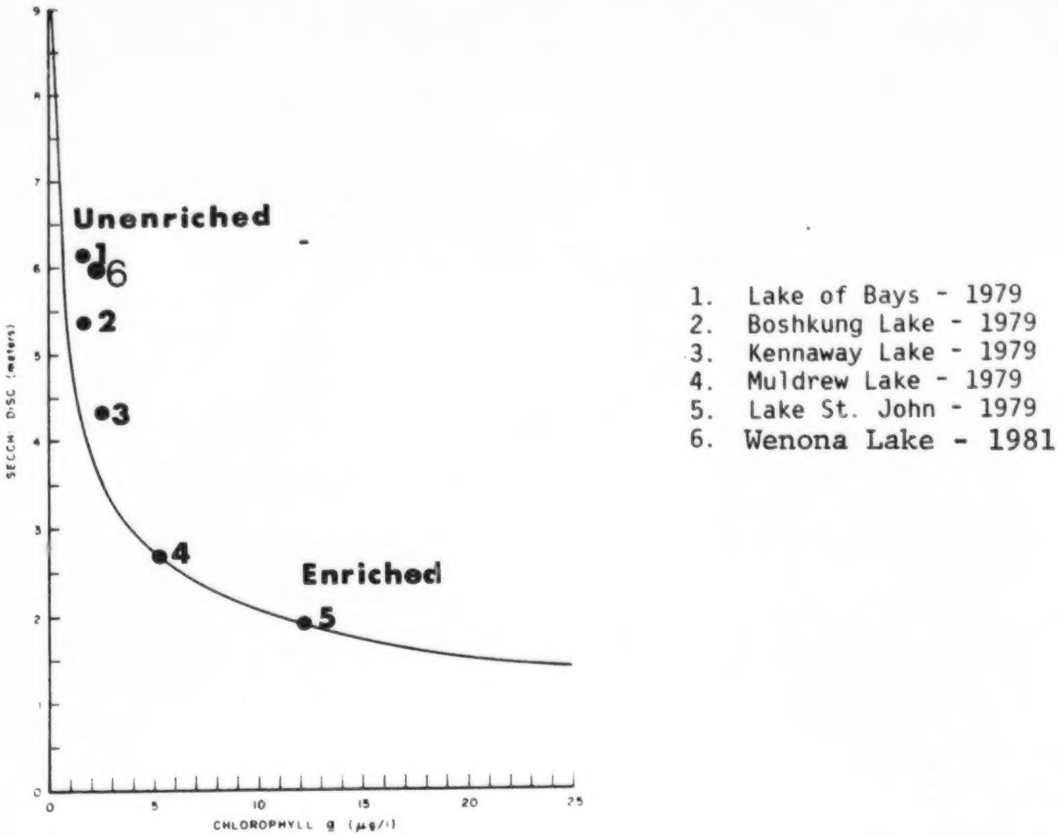
The Secchi disc readings exhibited very little fluctuation ranging from 5.5 to 6.75 m. Chlorophyll a concentrations ranged from 1.5 to 3.2 ug/L. Based on the seasonal means, Wenona Lake would be considered between moderately enriched and unenriched, characterized by a high degree of water transparency and moderately low densities of suspended algae.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Wenona Lake from 1977 to 1981.

Station	North Bay	
Year	S.D.	Chl.a
1971		
1972		
1973		
1974		
1975		
1976		
1977	5.8*	3.5*
1978		
1979	5.0	3.6
1980	4.8	2.9
1981	6.0	2.2

*MOE data

Figure 1: The relationship between Secchi disc and chlorophyll a for Wenona Lake and a number of recreational lakes in the province. All data are seasonal means.



Since the 1977 MOE survey was conducted, average chlorophyll a concentrations have decreased in Wenona Lake. Average Secchi disc readings have remained high during this period. We hope that participation in this program continues in order to monitor any long-term changes in the enrichment status of Wenona Lake.

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Wood Lake

Oakley Ward

Town of Bracebridge

District Municipality of Muskoka

TABLE 1: Secchi Disc (m) and chlorophyll a (ug/L) data collected from Wood Lake in 1981.

Station	Centre	
Date	S.D.	Chl.a
Aug. 2	3.7	2.0
9	3.5	0.8
23	3.4	2.4
Mean	3.5	1.7

Insufficient sampling was done on Wood Lake to obtain reliable seasonal means. Based on the information available Wood Lake would be classified as a moderately enriched lake, characterized by a moderately low degree of water transparency and low densities of suspended algae. The water in Wood Lake has some natural brown colour due to humic or peaty substances in the watershed. This colouration tends to reduce the degree of water transparency.

TABLE 2: Summary of mean values for Secchi disc (m) and chlorophyll a (ug/L) data collected from Wood Lake from 1972 to 1981.

Station	Centre	
Year	S.D.	Chl.a
1971		
1972	3.5**	5.1**
1973	- -	- -
1974	4.5	1.3
1975	4.7	2.9
1976	- -	- -
1977	- -	- -
1978	2.8*	3.0*
1979	4.3	3.6
1980	3.4	3.7
1981	3.5*	1.7*

* Based on less than 6 samples
** MOE data